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# ZANZIBAR PROTECTORATE.

Sir William Simpson

# ANNUAL REPORTS

ON THE

# MEDICAL AND PUBLIC HEALTH DEPTS.

FOR THE YEAR

1921.

174

ZANZIBAR

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# ZANZIBAR PROTECTORATE.

## REPORT ON THE MEDICAL DIVISION

## FOR THE YEAR 1921.

*General.*—The health of the inhabitants of this Protectorate has been good during the year under review, except for a mild epidemic of Influenza towards the end of the year.

*Prevalent Diseases.*—The Register indicates nothing unusual from previous years. Malaria, filariasis ulcers, ankylostomiasis, bilharziasis and venereal diseases being the most prevalent diseases.

*Native Hospital.*—In-patients, 751; Out-patients, 9,599. Operations:—Major, 76 and minor, 189, total 265. Maternity cases:—Normal, 10 and abnormal, 5.

*Malaria.*—Most of the cases are benign tertian infectious. In connection with quinine rash, I may record that a case always suffered from urticaria after quinine even in small doses by the mouth but had no rash on the administration of quinine intramuscularly.

*Yaws.*—In my report on Pemba for 1907-1908 I attributed the introduction of yaws into Pemba through slaves brought from the mainland. At present very few cases of yaws are seen in Zanzibar, and in Pemba it should be possible to stamp out the disease with injections of 914.

*Filariasis.*—Scrotal Elephantiasis cases are the most numerous seeking admission for operation. I have completely discarded the use of touniquet in these operations, as without it the flaps can be better shaped and what is most important the incision can accurately follow the contour of the line between healthy and diseased tissues. With an incision through the Medium Raphe and rapid work the bleeding is not much.

*Venereal Diseases.*—The cases are so numerous that in the near future a centre will have to be established for the intensive treatment of these diseases. At first the natives would not very willingly submit to injection, but they have been so impressed with the rapid disappearance of secondary eruptions that at present they prefer this method of treatment.

*Bilharziasis.*—The bladder form is very common indeed. The results of treatment with intravenous injections of Tartarated Antimony are most gratifying. In all cases I have used 20 cc of saline, and varied the rate of injections so as to allow of dilution in the blood stream.

*Influenza.*—The epidemic was of a mild character and most cases were treated with Bicarbonate of Soda, as advocated by Butler.

*Gaols.*—There has been an improvement in the health of the prisoners, and only four deaths during the year.

*Lunatic Asylum.*—Eight males and nine females were admitted during the year.

*European Hospital.*—It is most gratifying to record that the Government is considering the erection of a new Hospital, as the present building, although very good as regards site and accommodation, is most unsuitable for a Hospital.

Sixty-two in-patients were admitted during the year.

J. S. DE SOUSA,  
*Acting Principal Medical Officer.*

Zanzibar, 29th June, 1922.

## Table I.

Return of Diseases and Deaths for the year 1921 for the Protectorate.

| Diseases | Europeans | | Natives | | |
|---|---|---|---|---|---|
| | Zanzibar | | Zanzibar and Pemba | | |
| | In-patients | | In-patients | | Out-patients |
| | Admissions | Deaths | Admissions | Deaths | Total |
| INFECTIVE DISEASES. | | | | | |
| Beri-Beri | .. | .. | 3 | .. | 1 |
| Chicken-pox | .. | .. | 1 | .. | 2 |
| Dysentery | .. | .. | 16 | 1 | 28 |
| Enteric | .. | .. | 2 | .. | 8 |
| Erysipelas | .. | .. | 1 | .. | 3 |
| Gonorrhœa | .. | .. | 17 | .. | 673 |
| Influenza | .. | .. | 11 | .. | 88 |
| Leprosy—(*a*) Nodular | .. | .. | .. | .. | 1 |
| (*b*) Anæsthetic | .. | .. | .. | .. | 2 |
| Malaria (*a*) Benign Tertian | 3 | .. | 48 | .. | 373 |
| (*b*) Anartan | .. | .. | .. | .. | 1 |
| (*c*) Sub-Tertian | 15 | .. | 64 | .. | 1129 |
| (*d*) Chronic Malaria | 1 | .. | 4 | .. | 64 |
| (*e*) Blackwater Fever | 1 | .. | 5 | 1 | 2 |
| Measles | .. | .. | 3 | .. | 22 |
| Pneumonia | .. | .. | 37 | 13 | 24 |
| Rheumatism (Acute) | .. | .. | 1 | .. | 33 |
| Septicæmia | .. | .. | 1 | .. | .. |
| Small-pox | .. | .. | 1 | .. | 3 |
| Syphilis—(*a*) Primary | 1 | .. | 13 | .. | 184 |
| (*b*) Secondary | .. | .. | .. | .. | 77 |
| (*c*) Tertiary | .. | .. | 9 | .. | 34 |
| (*d*) Inherited | .. | .. | .. | .. | 7 |
| Tetanus | .. | .. | 4 | 4 | 1 |
| Tuberculosis | 1 | .. | 34 | 10 | 48 |
| Whooping Cough | .. | .. | .. | .. | 40 |
| Yaws | .. | .. | 4 | .. | 95 |
| Undefined Fever | 3 | .. | 120 | 1 | 1355 |
| Other Diseases | .. | .. | 2 | .. | 2 |
| INTOXICATIONS. | | | | | |
| Alcoholism | .. | .. | 1 | .. | 2 |
| GENERAL DISEASES. | | | | | |
| Anæmia | .. | .. | 5 | .. | 653 |
| Diabetes | .. | .. | 2 | .. | 1 |
| Gout | .. | .. | .. | .. | 4 |
| Debility | 1 | .. | 33 | 2 | 524 |
| Rheumatism (Chronic) | .. | .. | 37 | .. | 1193 |
| Other Diseases | .. | .. | .. | .. | 3 |
| LOCAL DISEASES. | | | | | |
| Sub-Section 1. | | | | | |
| *Diseases of the Nervous System.* | | | | | |
| Neuritis | 1 | .. | 2 | .. | 16 |
| Meningitis | .. | .. | 1 | 1 | .. |
| Myelitis | .. | .. | 1 | 1 | .. |
| Congestion of Brain | .. | .. | 1 | .. | .. |
| Other Diseases | .. | .. | 2 | .. | 2 |
| Sub-Section 2. | | | | | |
| Apoplexy | .. | .. | 3 | 2 | .. |
| Paralysis | .. | .. | 1 | .. | 14 |
| Chorea | .. | .. | 1 | .. | .. |
| Epilepsy | .. | .. | 7 | 2 | 11 |
| Carried forward | 27 | .. | 498 | 38 | 6723 |

## TABLE I—(*Continued*).

Return of Diseases and Deaths for the year 1921 for the Protectorate.

| Diseases | Europeans | | Natives | | |
|---|---|---|---|---|---|
| | Zanzibar | | Zanzibar and Pemba | | |
| | In-patients | | In-patients | | Out-patients |
| | Admissions | Deaths | Admissions | Deaths | Total |
| Brought forward .. | 27 | .. | 498 | 38 | 6723 |
| LOCAL DISEASES—(*Continued*). | | | | | |
| *Disease of the Nervous System.* | | | | | |
| Neuralgia .. .. | .. | .. | 1 | .. | 150 |
| Hysteria .. .. | .. | .. | 2 | .. | 7 |
| Hemiplegia .. .. | .. | .. | 4 | .. | 6 |
| Neurasthenia .. .. | .. | .. | 1 | .. | .. |
| Other Diseases .. .. | .. | .. | 4 | .. | 1 |
| Sub-Section 3.<br>*Mental Diseases* | | | | | |
| Mania .. .. | .. | .. | .. | .. | 1 |
| Melancholia .. .. | .. | .. | .. | .. | 2 |
| Delusional Insanity .. .. | .. | .. | 1 | .. | 1 |
| Other Diseases .. .. | .. | .. | 1 | .. | 2 |
| *Diseases of the Eye* | | | | | |
| Blepharitis .. .. | .. | .. | .. | .. | 24 |
| Conjunctivitis .. .. | .. | .. | 9 | .. | 342 |
| Keratitis .. .. | .. | .. | 2 | .. | 15 |
| Ulceration of Cornea .. .. | .. | .. | 4 | .. | 33 |
| Iritis .. .. | .. | .. | 2 | .. | 9 |
| Optic Neuritis .. .. | .. | .. | .. | .. | 2 |
| Cataract .. .. | .. | .. | 19 | .. | 27 |
| Other Diseases .. .. | .. | .. | 10 | .. | 37 |
| *Diseases of the Ear* | | | | | |
| Inflammation .. .. | .. | .. | .. | .. | 105 |
| Other Diseases .. .. | .. | .. | 1 | .. | 110 |
| *Diseases of the Nose* | | | | | |
| Coryza .. .. | .. | .. | .. | .. | 165 |
| Other Diseases .. .. | .. | .. | .. | .. | 7 |
| *Diseases of the Circulatory System* | | | | | |
| Endocarditis .. .. | .. | .. | .. | .. | 2 |
| Myocarditis .. .. | .. | .. | 17 | 1 | .. |
| Valvular, Mitral .. .. | .. | .. | 12 | 5 | 30 |
| Aneurism .. .. | .. | .. | 4 | .. | 1 |
| Other Diseases .. .. | .. | .. | 8 | 3 | 2 |
| *Diseases of the Respiratory System* | | | | | |
| Laryngitis .. .. | 2 | .. | .. | .. | 3 |
| Bronchitis .. .. | .. | .. | 47 | .. | 2502 |
| Broncho-Pneumonia .. .. | .. | .. | 1 | .. | 25 |
| Emphysema .. .. | .. | .. | 1 | .. | .. |
| Pleurisy .. .. | .. | .. | 9 | .. | 6 |
| Asthma .. .. | .. | .. | 6 | .. | 119 |
| Other Diseases .. .. | .. | .. | .. | .. | 8 |
| *Diseases of the Digestive System* | | | | | |
| Stomatitis .. .. | .. | .. | .. | .. | 44 |
| Caries of Teeth .. .. | .. | .. | .. | .. | 1151 |
| Glossitis .. .. | .. | .. | .. | .. | 5 |
| Pharynigitis .. .. | .. | .. | 2 | .. | 46 |
| Tonsilitis .. .. | 1 | .. | 2 | .. | 146 |
| Gastritis .. .. | 1 | .. | 2 | .. | 52 |
| Ulceration of Stomach .. .. | .. | .. | .. | .. | 1 |
| Carried forward .. | 31 | .. | 670 | 47 | 11912 |

## TABLE I—(*Continued*).

## Return of Diseases and Deaths for the year 1921 for the Protectorate.

| Diseases | Europeans | | Natives | | |
|---|---|---|---|---|---|
| | Zanzibar | | Zanzibar and Pemba | | |
| | In-patients | | In-patients | | Out-patients |
| | Admissions | Deaths | Admissions | Deaths | Total |
| Brought forward | 31 | .. | 670 | 47 | 11912 |
| LOCAL DISEASES—(*Continued*). | | | | | |
| *Diseases of the Digestive System* | | | | | |
| Eyspepsia | 3 | .. | 2 | .. | 365 |
| Dnteritis | .. | .. | 1 | .. | 4 |
| Appendicitis | 2 | .. | 2 | .. | 3 |
| Colitis | .. | .. | 2 | .. | 4 |
| Ulceration of Intestines | .. | .. | 1 | .. | .. |
| Hernia | .. | .. | 110 | .. | 98 |
| Diarrhœa | 1 | .. | 13 | .. | 127 |
| Constipation | .. | .. | 11 | .. | 2982 |
| Colic | .. | .. | 9 | .. | 443 |
| Hæmorrhoids | .. | .. | 3 | .. | 34 |
| Hepatitis (Acute) | .. | .. | 1 | .. | 2 |
| Hepatic (Congestion) | 4 | .. | 16 | .. | 334 |
| Abscess (Hepatic) | .. | .. | 2 | .. | .. |
| Cirrhosis (Hepatic) | 2 | .. | 2 | 2 | 9 |
| Jaundice | .. | .. | 3 | .. | 12 |
| Peritonitis | .. | .. | 3 | 3 | 1 |
| Ascites | .. | .. | 3 | .. | 11 |
| Other Diseases | .. | .. | 4 | .. | 21 |
| *Diseases of the Lymphatic System* | | | | | |
| Splenitis | .. | .. | .. | .. | 187 |
| Inflammation of Lymphatic Gland | 3 | .. | 8 | .. | 18 |
| Suppuration of do. | .. | .. | 2 | .. | 4 |
| Lymphangitis | .. | .. | 9 | .. | 45 |
| do. (Filarial) | .. | .. | 1 | .. | 2 |
| Other Diseases | .. | .. | 3 | .. | .. |
| *Diseases of the Urinary System* | | | | | |
| Nephritis (Acute) | .. | .. | .. | .. | 4 |
| ,, (Chronic) | .. | .. | 8 | 1 | 3 |
| Pyelitis | .. | .. | .. | .. | 1 |
| Renal Colic | .. | .. | 1 | .. | .. |
| Cystitis | .. | .. | 1 | .. | 14 |
| Hæmaturia | .. | .. | 2 | .. | 21 |
| Hæmaturia (Bilharzial) | .. | .. | 8 | .. | 88 |
| Other Diseases | 2 | | 4 | 1 | 4 |
| *Diseases of the Generative System* | | | | | |
| Male Organs— | | | | | |
| Urethritis (Acute) | .. | .. | .. | .. | 7 |
| do (Chronic) | .. | .. | .. | .. | 36 |
| Stricture | .. | .. | 19 | 1 | 24 |
| Prostratitis | .. | .. | 1 | .. | .. |
| Soft Chancre | .. | .. | 4 | .. | 60 |
| Haematocele | .. | .. | 1 | .. | .. |
| Hydrocele | 1 | .. | 48 | .. | 167 |
| Varicocele | .. | .. | 1 | .. | 9 |
| Orchitis | 1 | .. | 15 | .. | 129 |
| Epididymitis | 1 | .. | 4 | .. | 17 |
| Abscess of Testicle | .. | .. | 3 | .. | .. |
| Other Diseases | .. | .. | 11 | 1 | 20 |
| Carried forward | 51 | .. | 1012 | 56 | 17222 |

## TABLE I—(*Continued*).

Return of Diseases and Deaths for the year 1921 for the Protectorate.

| Diseases | Europeans | | Natives | | |
|---|---|---|---|---|---|
| | Zanzibar | | Zanzibar and Pemba | | |
| | In-patients | | In-patients | | Out-patients |
| | Admissions | Deaths | Admissions | Deaths | Total |
| Brought forward .. | 51 | .. | 1012 | 56 | 17222 |
| LOCAL DISEASES—(*Continued*). | | | | | |
| *Diseases of the Generative System.* | | | | | |
| Female Organs- | | | | | |
| Ovaritis .. .. | .. | .. | .. | .. | 1 |
| Ovarian Cyst .. .. | .. | .. | 2 | .. | .. |
| Endometritis .. .. | .. | .. | 1 | 1 | 4 |
| Displacement of Uterus .. | .. | .. | .. | .. | 1 |
| Vaginitis .. .. | .. | .. | 1 | .. | 4 |
| Dysmenorrhœa .. .. | .. | .. | .. | .. | 8 |
| Menorrhagia .. .. | .. | .. | .. | .. | 14 |
| Confinement .. .. | .. | .. | 15 | .. | .. |
| Leucorrhœa .. .. | .. | .. | 1 | .. | 1 |
| Abortion .. .. | .. | .. | 2 | 1 | .. |
| Delayed Labour .. .. | . | .. | 1 | 1 | .. |
| Retained Placenta .. .. | ... | .. | 2 | .. | .. |
| Mastitis .. .. | .. | .. | 3 | .. | 2 |
| Abscess of Breast .. .. | .. | .. | 1 | 1 | 15 |
| Fibroid Uterine .. .. | .. | .. | 2 | .. | 3 |
| Other Diseases .. .. | .. | .. | 17 | 3 | 8 |
| *Diseases of the Organs of Locomotion* | | | | | |
| Osteitis .. .. | .. | .. | 4 | .. | .. |
| Arthritis .. .. | .. | .. | 5 | .. | 6 |
| Synovitis .. .. | 2 | .. | 9 | .. | 72 |
| Bursitis .. .. | 1 | .. | 1 | .. | .. |
| Myalgia .. .. | .. | .. | 2 | .. | 89 |
| Nicrosis ... .. | 1 | .. | 1 | .. | .. |
| Priostitis .. .. | .. | .. | 1 | .. | .. |
| Other Diseases .. .. | .. | .. | 2 | 1 | 13 |
| *Diseases of Connective Tissue* | | | | | |
| Cellulitis .. .. | .. | .. | 10 | 1 | 65 |
| Abscess .. .. | 1 | .. | 37 | 1 | 258 |
| Elephantiasis .. .. | .. | .. | 43 | 1 | 74 |
| Other Diseases .. .. | 5 | .. | 4 | .. | .. |
| *Diseases of the Skin* | | | | | |
| Urticaria .. .. | .. | .. | .. | .. | 6 |
| Eczema .. .. | .. | .. | 5 | .. | 100 |
| Boils .. .. | .. | .. | 3 | .. | 201 |
| Carbuncle .. .. | .. | .. | 1 | .. | 2 |
| Herpes .. .. | .. | .. | 3 | ... | 11 |
| Psoriasis .. .. | .. | .. | 1 | .. | 26 |
| Tinea .. .. | .. | .. | 2 | .. | 111 |
| Tinea Cruris .. .. | ... | ... | .. | .. | 38 |
| Scabies .. .. | ... | .. | 13 | .. | 468 |
| Prickly Heat .. .. | .. | .. | .. | .. | 14 |
| Ulcers .. .. | ... | .. | 173 | 1 | 4702 |
| Other Diseases .. .. | .. | ... | 4 | .. | 115 |
| Carried forward .. | 61 | .. | 1384 | 68 | 23654 |

## TABLE I—(*Continued*).

Return of Diseases and Deaths for the year 1921 for the Protectorate.

| Diseases | Europeans | | Natives | | |
|---|---|---|---|---|---|
| | Zanzibar | | Zanzibar and Pemba | | |
| | In-patients | | In-patients | | Out-patients |
| | Admission | Deaths | Admission | Deaths | Total |
| Brought forward | 61 | .. | 1384 | 68 | 23654 |
| LOCAL DISEASES—(*Continued.*) | | | | | |
| *Injuries.* | | | | | |
| General | 1 | .. | 5 | 1 | 1482 |
| Local | .. | .. | 193 | 3 | 1296 |
| Surgical Operations | .. | .. | 16 | .. | .. |
| Tumours (Simple) | .. | .. | 18 | .. | 10 |
| do (Malignant) | .. | .. | 8 | 2 | .. |
| *Poisons* | .. | .. | 2 | .. | .. |
| Nematoda— | | | | | |
| Ascaris | .. | .. | 4 | .. | 11 |
| Filariasis | .. | .. | 26 | .. | 112 |
| Ankylostomiasis | .. | .. | 179 | 6 | 768 |
| Other Diseases | .. | .. | .. | .. | 5 |
| Insecta— | | | | | |
| Myiasis | .. | .. | .. | .. | 17 |
| Other Diseases | .. | .. | .. | .. | 13 |
| Total | 62 | .. | 1835 | 80 | 27368 |

## FINANCIAL MEDICAL DIVISION.

## Statement of Expenditure and Revenue for the year 1921.

### EXPENDITURE.

| Details | Estimated | | | | | Actual | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Rs. | cts. | £ | *s.* | *d.* | Rs. | cts. | £ | *s.* | *d.* |
| MEDICAL. | | | | | | | | | | |
| Personal Emoluments | 179.941 | 00 | 17.994 | 0 | 0 | 162.670 | 42 | 16.267 | 0 | 10 |
| *Other Charges.* | | | | | | | | | | |
| Fuel and Light | 4,500 | 00 | 450 | 0 | 0 | 5.341 | 47 | 534 | 2 | 11 |
| Incidental Expenses | 500 | 00 | 50 | 0 | 0 | 430 | 94 | 43 | 1 | 11 |
| Maintenance of Hospitals | 20,000 | 00 | 2,000 | 0 | 0 | 24,525 | 12 | 2,452 | 10 | 3 |
| Medical and Surgical Stores | 20,000 | 00 | 2,000 | 0 | 0 | 10,459 | 43 | 1,045 | 18 | 10 |
| Passages | 12,000 | 00 | 1,200 | 0 | 0 | 16.744 | 49 | 1.674 | 9 | 0 |
| Purchase of Opium | 1,000 | 00 | 100 | 0 | 0 | .. | .. | .. | .. | .. |
| Rent of Houses | 2,280 | 00 | 228 | 0 | 0 | 1.356 | 00 | 135 | 12 | 0 |
| Travelling Expenses | 800 | 00 | 80 | 0 | 0 | 819 | 96 | 81 | 19 | 11 |
| Total Expenditure | 241.021 | 00 | 24.102 | 0 | 0 | 222.347 | 83 | 22,234 | 15 | 8 |
| Special Expenditure | | | | | | | | | | |
| Furniture and Equipment for District Dispensary | 900 | 00 | 90 | 0 | 0 | 590 | 21 | 59 | 0 | 5 |
| Course of Tropical Medicines to Medical Officers | .. | 00 | 0 | 0 | 0 | 417 | 25 | 41 | 14 | 6 |
| Total Expenditure | 900 | 00 | 90 | 0 | 0 | 1,007 | 46 | 100 | 14 | 11 |

### REVENUE.

| Details | Estimated | | | | | Actual | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Rs. | cts. | £ | *s.* | *d.* | Rs. | cts. | £ | *s.* | *d.* |
| Hospital charges from European and Native Hospitals | 6.000 | 00 | 600 | 0 | 0 | 10.977 | 09 | 1.097 | 14 | 2 |
| Total Revenue | 6,000 | 00 | 600 | 0 | 0 | 10.977 | 09 | 1,097 | 14 | 2 |

# REPORT ON THE MEDICAL DIVISION, PEMBA,

## FOR THE YEAR 1921.

Dr. Howard was stationed at Chake Chake as sole Medical Officer of Pemba till he went on leave, about the end of February, 1921. The work at Chake Chake was then taken over by Dr. Craig for the rest of the year; Dr. Howard being posted to Weti on his return from leave in November, 1921.

From the beginning of September there was no Nursing Sister stationed in Pemba. The work has continued on the same lines as in preceding years. The numbers, both of out-patients and in-patients, have been fairly well maintained.

Return of Out-patients treated in Pemba during 1921.

| | |
|---|---|
| Chake Chake ... ... ... | 5,945 |
| Weti ... ... ... | 2,637 |
| Mkoani ... ... ... | 2,196 |

Eighty-six operations were performed under general anæsthesia, including Radical cure of Inguinal Hernias, amputation of Elephantoid Scrotum and Cataract Extractions. There was one death from Oeteomyelitis of the Femur with septic infection of knee joint.

A considerable number of minor operations were done under local anæsthesia.

The commonest diseases have been the same as in former years.

*Ankylostomiasis* is extremely prevalent among the bare-footed population and causes much ill-health and loss of labour in the shambas. Treatment with Oil of Chenopodium (carried out in the out-patient department) is very successful and apparently very free from risk, but re-infection is almost inevitable.

*Urinary Bilharziasis*, while common enough, does not compare with Ankylostomiasis in the amount of disablement it causes. Systematic treatment with intravenous injections of Tartarated Antimony was begun, but it was found that after three or four injections, resulting probably in the disappearance of blood from the urine, the patients ceased to attend. Treatment of these cases as in-patients would probably be more successful. No case of rectal Bilharziasis was recognised. Not much permanent benefit will result until prophylactic measures are taken against these two diseases, and it would appear that this must await the appointment of a Medical Officer of Health for the Island of Pemba.

*Malaria*, nearly altogether of the Sub-tertian variety, is the cause of much illness, but as a rule is very amenable to treatment by quinine. Malignant attacks, with a varied symptomatology but most commonly cerebral, are not uncommon. Quinine given intramuscularly usually averts a fatal issue. It is extremely rare to find crescents in the blood.

During the year there were three cases of Blackwater Fever, one in a Swahili at Weti which was fatal, one in a Chinaman at Chake Chake, and one in a Goanese at Mkoani, both the latter recovered.

Prophylactic quinine has been regularly administered to the Subordinate Staff, the Police, school children and prisoners. Its importance has been impressed also on Europeans and others.

*Filarial infection* is very common, but most cases present no symptoms. Many have a symptomless swelling in the famoral region from this cause. Filarial lymphangitis and filarial abscess are not uncommon. Treatment is most frequently sought for Elephantiasis of the Scrotum. Hernia (inguinal) and Hydrocele are very prevalent and seem to be predisposed to by filarial infection.

Ulcers (acute, chronic, septic, or due to Syphilis or Yaws) form the bulk of the cases coming for treatment in the out-patient dressing-room.

The diagnosis of Yaws from Syphilis is often by no means easy, and it is very probable that cases of Yaws have been taken for Syphilis. Gonorrhœa is common but does not appear to be very virulent.

Tuberculosis of the lung is fairly prevalent among both Swahilis and Indians, and it is attributable to their dislike for ventilation in their houses. Other manifestations of tuberculosis appear to be uncommon.

Bronchial Catarrh and Asthma are common. Bowel complaints, other than constipation, are uncommon. There were no cases suggestive of either Typhoid Fever or Dysentery.

*European Officials.*—The health of the European Officials has been good with the exception of one new to Pemba, who suffered considerably from Malarial Fever.

*Subordinate Staff.*—While the health of the Subordinate Staff has been satisfactory, a few have suffered from frequent attacks of Malarial Fever, and in some cases have had to be transferred to Zanzibar as being unfit for service in Pemba. Three were treated in Hospital.

*Prisoners.*—The health of prisoners has been good. Seven were treated in hospital. There was no epidemic disease and no death.

P. L. CRAIG,
*Medical Officer, Pemba.*

Pemba, 29th June, 1922.

# REPORT ON THE PUBLIC HEALTH DEPARTMENT

## FOR THE YEAR 1921.

The work performed by the Public Health Department is under the control of the Medical Officer of Health and is divided into the following sections :—

I.—Public Health Division, in charge of the Medical Officer of Health. This includes—

1. Sanitation of the Town and Port of Zanzibar.
2. Sanitation of the Islands of Zanzibar and Pemba.
3. Port Quarantine Service, including charge of the Quarantine Station for Zanzibar, Kenya, Uganda Protectorate, and Tanganyika Territory. X [illegible]
4. Suppression of Infectious Diseases.
5. Infectious Diseases Hospital.
6. Bacteriological and Public Health Laboratories.
7. Poor and Leper Asylums.
8. Vital Statistics.
9. School Medical Service, including—
    - (*a*) Medical Inspection of school children.
    - (*b*) Charge of the School Dispensary and treatment of sick children.
    - (*c*) Lectures on Hygiene and allied subjects to Teachers.
10. Control of Opium.

II.—Veterinary Section, in charge of the Veterinary Officer, including—

1. Central Inspection and Quarantine of Imported Stock.
2. Meat Inspection.
3. Inspection of Milch Cows, Horses, Cattle, Camels, etc.
4. Charge of the Veterinary Hospital.
5. Investigation, Control and Treatment of Diseases of Local Stock.

III.—Biological Section, in charge of the Economic Biologist.

1. Research into the Protozoal and Parasitic Diseases of man and animal, and the investigation of insects causing diseases in man, animal and plants in the Protectorate.
2. General Biological Research.

## STAFF.

Dr. B. Spearman, Medical Officer of Health, was in charge of the Department throughout the year. He paid visits of inspection to Pemba in January and August.

The Economic Biologist was responsible for the administration of the Veterinary Department.

Mr. Shah Mohammed Khan, Veterinary Officer, was on leave from August 18th to the end of the year. During his absence his duties were shared by the Medical Officer of Health and Senior Laboratory Assistant.

## PART I.—SANITARY LAW.

The " Manufacture and Sale of Aerated Waters Decree " was promulgated on the 23rd of May, 1921. With adequate inspection of mineral water factories and periodical bacteriological and chemical examination of samples, a satisfactory standard of purity should be ensured.

To enable more exemplary punishment for the offence of neglect to report notifiable diseases, Section 26 (2) of " The Public Health Decree of 1909 " was amended by increasing the fine penalty from Rs. 50 to Rs. 1,000.

The Quarantine Regulations issued under " The Zanzibar Ports Decree, 1911," were amended during the year to include Cholera, Yellow Fever, Small-Pox, Typhus and Cerebo-Spinal Meningitis in the term of infectious and contagious diseases to the same extent as Plague, and the regulations governing the latter were made applicable to these diseases. The Medical Officer of Health has also been given further powers in the matter of placing under surveillance or isolation passengers arriving in infected ships.

The importation into Zanzibar of condensed skimmed milk containing less than 9 per cent. of milk fat was prohibited under a regulation issued under " The Customs Decree, 1911."

The traffic in opiates was further restricted during the year by subjecting its importation to a certificate from the British Resident certifying that the import is approved by him and is required solely for medicinal or scientific purposes.

## Part II.—Sanitation, Zanzibar Town.

The following table shows the routine work done during the year :—

### Table I.

| | |
|---|---|
| Inspectors | 18 |
| Inspection of premises | 3,614 |
| General nuisance notices | 569 |
| Visits to hotels and boarding-houses | 2,172 |
| Notices served | 14 |
| Godowns inspected | 975 |
| Visits to bakehouses | 171 |
| Notices served | 6 |
| Visits to dairies and cowsheds | 1.116 |
| Notices served | 10 |
| Visits to foodstalls and markets | 2,439 |
| Notices served | 2 |
| Average number of cesspools oiled weekly | 356 |
| Average amount of oil used weekly (gallons) | 9 |
| Latrines regularly cleaned | 4 |
| Public urinals regularly cleaned | 5 |
| Public lands and graveyards regularly cleaned | 132 |
| Houses cleaned and disinfected | 28 |
| Cartloads of refuse removed | 46,054 |
| Rats collected, trapped or poisoned | 10,877 |
| Pariah dogs destroyed | 26 |
| Paupers removed to Walezo Poorhouse | 84 |
| Burials of paupers and others carried out | 50 |
| Cesspools emptied out | 8 |
| Premises disinfected | 18 |
| Visits to dwelling-houses, etc., for mosquito nuisance | 28,950 |
| Notices served | 284 |

*Water Supply.*—Several visits were paid to the Chem-Chem collecting area by the Medical Officer of Health and the Director of Public Works. The whole area has been enclosed and no cultivation other than that of coconuts is allowed. The necessary labour is strictly controlled. Surface contamination of this supply is therefore reduced to the minimum.

Samples of the water from Chem-Chem springs were analysed during the year with satisfactory results.

Owing to the long continued dry weather it was thought that it might be necessary to supplement the water supplied from the Chem-Chem springs. Samples were therefore taken from the stream running below these springs and under the water pipes. These samples were found to be so contaminated that efficient disinfection by chlorine or filtration would have been necessary to render this stream safe for domestic purposes. Fortunately the advent of the rains obviated the necessity of using this water.

Visits were paid to the new springs at Bububu and samples taken for analysis. These showed an excellent water, free from any contamination and suitable for domestic purposes. The installation of this water supply in the near future should prove a great boon to the town of Zanzibar, and preclude all possibility of shortage of water in future years. Could a sufficient head of water be raised to bring water by gravity to the top floors of the houses the water supply of the town would be ideal.

It is now to be hoped that in the near future a water carriage system of drainage and sewage disposal may be put into more of the houses of those who, by their education and training, are accustomed to them and understand their use.

*Drainage.*—Constant attention is required to keep the various drainage channels free owing to blocking by debris, silting of sand and friable road surfaces. It is remarkable in what a short space of time an accumulation of water in a drain, due to any of these causes, becomes filled with mosquito larvæ.

*Cesspools and Privy Pits.*—Practically the only system of sewage and waste water conservancy throughout the town of Zanzibar is that of cesspools for waste water and privy pits for night soil. It is really remarkable what little nuisance these latter give rise to, especially when one considers that the town is riddled with them. Occasionally, especially in Indian " challs " or boarding-houses where they are used by a large number of people, they become an offensive nuisance owing to the fact that they are not emptied with sufficient frequency. Generally, however, the porous, sandy soil absorbs the water, bacterial action rapidly renders the fæces innocuous, and they keep quite free from smell and do not breed mosquitoes. It is difficult to see what other form of conservancy could replace this. Even if expense did not prohibit the introduction of a water carriage system, except on a limited scale in the better-class houses, it would prove eminently unsatisfactory with the type of population in Zanzibar, whose ignorance and carelessness would lead to constant blocks and breakdowns, with results far more insanitary than the present system. With adequate inspection to prevent the occurrence of nuisances, the present system appears the best. Endeavours were continued to improve the light and ventilation of these privies and to insist on their position against an outside wall and their isolation from the kitchen, although it would unfortunately seem to be a deeply-rooted idea, both among the Indians and natives, that the kitchen and privy should be one, separated only by a thin partition.

The cesspools are much more undesirable from the public health point of view, as they are undoubtedly a fertile source of mosquitoes, in particular, *culex fatigans*, the cause of Elephantiasis, which is so prevalent in Zanzibar. Most of these cesspools are simply pits built over with masonry and with an inlet pipe leading from kitchen or bathroom, but with no outlet and quite inaccessible. Mosquitoes pass down these pipes and breed freely, so that *culex* is a perfect pest in many parts of the town and freely transmits filaria from the infected to the healthy. Considering the enormous number of cesspools scattered throughout the town, it will be a long, tedious and expensive matter effectively to deal with them all, but until this is done the *culex* nuisance and heavy filaria incidence will continue. At present, as time allows, a register is being taken of all cesspools, and the owners are called on to replace the masonry roofs with properly fitting cement covers. These cesspools are oiled once a week with a mixture of crude oil and kerosine. The number provided with these covers and oiled weekly has increased in 1921 from 242 to 356. Eventually it is to be hoped that all cesspools will be provided with water seal traps, which should obviate the necessity and expense of weekly oiling, but whether with traps or without them accurately fitting inspection covers are necessary. Undoubtedly the regular treatment of these cesspools reduces the local *culex* incidence.

*Town Refuse Collection and Disposal.*—This is done by means of carts which collect the refuse from bins placed in convenient positions. The carts, 51 in number, do two rounds daily, starting at 6-30 a.m. and 1 p.m., except on Sundays, when they do one round only, three men accompany each cart. The refuse-bins are round metal cylinders, 2 ft. 7 in. high and 1 ft. 7½ in. in circumference. They have no bottom, but stand on a cement slab in order to facilitate cleaning. They are provided with a spring cover to ensure that they are kept closed. This end, however, is usually defeated by the local inhabitants propping them open with sticks or stones and thus breaking the springs. House refuse-boxes, made out of old whiskey cases provided with lids and tarred, are supplied to householders where necessary. These are made in the carpenters' shop in the Health Department, 372 being turned out last year. Complaints were from time to time received of the nuisance caused by the refuse-boxes. This was largely due to the habit of householders placing their refuse-boxes in the streets immediately after the carts had passed. The attention of the police was, therefore, drawn to the fact that this was contrary to the "Public Health Dceree" by a notice in the *Official Gazette*. All refuse is destroyed by incineration, either in the Horsfall Destructor or in the local rail incinerators placed in sites in the native quarter of N'gambo, where the carts cannot approach owing to broken paths and sandy roads. The destructor causes a certain amount of nuisance in its immediate neighbourhood by reason of smoke and dust. Flies, too, are very prolific there, and, unfortunately, the destructor is situated too close to the markets, which are infested with flies from this source.

*Dairies and Cowsheds.*—The position as regards the town dairies and cowsheds is the same as last year. It is confidently expected, however, that it will be possible to make a start during the coming year in getting some of these cows housed in the new sheds at Mji Mpia. At present they still remain empty for lack of an adequate water supply. As soon as water is available, they will be thrown open for use by the dairymen, and as time goes on it is hoped that accommodation will be provided for all milch cattle in the town. When once all the milch cattle are housed in these Government sheds, and the initial difficulties of administration and organisation are overcome, Zanzibar should have a milk supply equal to that of any modern city. Under present conditions it is impossible to guarantee a pure supply. Samples of milk were taken from all the dairies in the town during the year, and analysed in the Public Health Laboratories. The results in nearly every case, except that of the Government herd, were unsatisfactory. In addition to the milk supplied from the town dairies, milk is brought in from outlying shambas and sold by itinerant vendors on bicycles. Samples of these were examined and found to be diluted with water and to be contaminated with cow-dung. It is very necessary that more efficient control be exercised over these men, and that the police be given powers to seize samples for examination. One cowshed was closed during the year owing to its insanitary condition, and the cows were housed in the wing of the Government Stables until such repairs were effected as rendered the cowshed as sanitary as the other cowsheds in the town.

*Markets.*—The markets were regularly inspected during the year. One Sanitary Inspector is detailed to the market for the purpose of sanitary supervision. Owing to the proximity of the destructor, flies are a great nuisance. Great numbers are caught by means of hanging lines soaked in "Tanglefoot." The accommodation in the poultry market is insufficient for the number of birds brought in, and an extension is necessary.

*Mineral Water Factories.*—These were regularly inspected throughout the year and samples of mineral water taken from the different factories for analysis. Taken as a whole, the results were fairly satisfactory. The commonest fault is to find traces of copper in samples, due to the tin wearing off the copper valves. It was pointed out to the different factories' managers who were at fault that regular re-tinning of the valves was necessary. Other factories showed an excessive number of B.Coli colonies per C.C., due probably to lack of cleanliness on the part of the workers. An interview with the managers resulted in improvements. Unfortunately, owing to the various calls on the time of the Medical

Officer of Health and the large amount of work in the Laboratory, it has not been found possible to make repeated analysis of the various mineral waters. Insistence on observation of the rules of the new Decree should establish the manufacture of mineral waters on a satisfactory hygienic basis.

*Mosquito Preventive Measures.*—The work of the mosquito brigade continued the same measures as last year. As will be seen from the accompanying table, by far the greater number of larvæ found are *Stegomyia*, probably because they are the most easily found. This is a domestic mosquito which breeds in any uncovered receptacle of clear water, and their presence is entirely due to the neglect of householders in allowing such receptacles to stand about unprotected on their premises. As it is necessary that mosquito larvæ should be found a second time within twenty days before proceedings can be instituted, it is practically impossible to obtain a conviction for this offence. Anopheles are fortunately uncommon in the town area and, except during the rainy season, their breeding-places are generally easily dealt with when found. As a guard against Anopheles, mosquito traps, which consist of half tubs filled with water, are placed at convenient places round the periphery of the town. Usually these are negative to Anopheles. When Anopheles' larvæ are found a systematic search for permanent breeding-places in the neighbourhood is at once instituted. *Culex fatigans*, as mentioned in the section on conservancy, is the most difficult mosquito to eradicate, and will remain a nuisance and a source of danger to public health until all cesspools are properly trapped and covered. Still, a good deal is done to discover and deal with their less-permanent breeding-places. The mosquito brigade, as a whole, do very good work, but better results would be obtained with more adequate supervision, which at present it is not possible to give.

## TABLE II.

### Breeding places of various kinds of mosquitoes found in Zanzibar Town during 1921.

| Months | Tanks, Cisterns, Drums and Barrels | | | Drains and Cesspools | | | Old Tins, Broken Bottles, etc. | | | Boats, etc. | | | Swamps and Pools | | | Mosquito Traps | | | Total | | | Rainfall. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1921 | S* | C* | A* | S | C | A | S | C | A | S | C | A | S | C | A | S | C | A | S | C | A | Inches. |
| January .. .. | 17 | 0 | 2 | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 11 | 1 | 51 | 16 | 3 | 1·39 |
| February .. .. | 12 | 0 | 2 | 0 | 3 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 9 | 0 | 45 | 12 | 3 | 2·48 |
| March .. .. | 22 | 1 | 1 | 0 | 6 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 8 | 1 | 75 | 15 | 2 | 4·77 |
| April .. .. | 22 | 1 | 2 | 1 | 0 | 0 | 9 | 2 | 1 | 0 | 0 | 0 | 0 | 2 | 8 | 30 | 3 | 0 | 62 | 8 | 11 | 17·00 |
| May .. .. | 24 | 4 | 2 | 0 | 2 | 0 | 6 | 5 | 9 | 0 | 0 | 0 | 0 | 0 | 2 | 28 | 3 | 0 | 58 | 14 | 13 | 4·58 |
| June .. .. | 18 | 5 | 0 | 0 | 3 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 9 | 6 | 52 | 19 | 6 | 0·37 |
| July .. .. | 16 | 0 | 1 | 0 | 8 | 0 | 5 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 23 | 8 | 1 | 44 | 19 | 3 | 1·62 |
| August .. .. | 11 | 1 | 0 | 0 | 2 | 0 | 4 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 3 | 0 | 32 | 10 | 1 | 0·59 |
| September .. .. | 6 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 19 | 6 | 0 | 27 | 9 | 3 | 0·32 |
| October .. .. | 12 | 3 | 0 | 0 | 2 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 15 | 2 | 0 | 29 | 9 | 1 | 5·39 |
| November .. .. | 10 | 4 | 1 | 0 | 2 | 0 | 8 | 5 | 2 | 0 | 1 | 0 | 0 | 0 | 5 | 19 | 1 | 0 | 37 | 13 | 8 | 9·41 |
| December .. .. | 19 | 1 | 0 | 0 | 5 | 0 | 6 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 25 | 4 | 0 | 53 | 10 | 2 | 1·79 |
| Total .. .. | 189 | 21 | 11 | 1 | 40 | 0 | 71 | 23 | 17 | 4 | 1 | 0 | 0 | 2 | 19 | 300 | 67 | 9 | 565 | 154 | 56 | 49·71 |

* S—Stegomyia fasciata. C—Culicinæ. A—Anophelinæ.

Three cases of black-water fever having occurred among askaris of the 3rd King's African Rifles stationed at Ziwani lines, the Medical Officer of Health was instructed to examine and report on the best methods of reducing the anopheline incidence there. As a preliminary, with the assistance of the Medical Officer in Charge, King's African Rifles, the men and their women and children were examined with a view to finding their spleen and parasite rate. A very high rate of infection was shown, but it must be borne in mind that all were not necessarily infected in Zanzibar. The Medical Officer of Health, with the assistance of the Economic Biologist and the Medical Officer in Charge, King's African Rifles, then examined the area, including and surrounding the lines, and submitted a report to the British Resident, who, at a subsequent date, himself inspected the lines and the surrounding area.

## PART III.—SANITARY SUPERVISION OF THE ISLANDS OF ZANZIBAR AND PEMBA.

The Medical Officer of Health proceeded to Pemba in January and visited the Stations of Chake Chake, Weti, and Mkoani, and inspected the Leper Settlements at Pujini and Nduni and submitted a report on the general sanitation of the townships and made recommendations on different matters.

In August the Medical Officer of Health again visited Pemba in the company of the British Resident, and, in conjunction with the Medical Officer of Health (Pemba), the Acting Director of Public Works, and Dr. Spurrier, C.M.G., O.B.E., drew up a report as to the means best adapted to dealing with the mosquito nuisance in Chake Chake. This was further supplemented by a most interesting and lucid report from Dr. Spurrier.

Visits were also paid during the year to Mwera, Chwaka, Chukwani, Mkokotoni, and Tumbatu Island and other parts of the island during the outbreak of Small-pox.

## PART IV.—PORT QUARANTINE SERVICE.

The subjoined table shows the quarantine work done during the year. The work was exceptionally heavy, as six mail ships arrived in quarantine with Small-pox on board during the year. Five of these were British India Steam Navigation Co.'s boats from Bombay, viz., the "Karagola" (three times), the "Baroda" and the "Karoa." The deck passengers were removed to Prison Island Quarantine Station, all the crews and remaining passengers vaccinated and the ships disinfected and fumigated before proceeding on their voyage. Fortunately, no cases of Small-pox occurred among the passengers quarantined on Prison Island. This I attribute chiefly to the fact that the passengers are spread out in separate quarters over the island, their clothes and gear are washed and disinfected, they themselves are able to bathe and clean themselves thoroughly, and all are vaccinated. Undoubtedly had they been allowed to land at East African ports with no period of quarantine, cases would have occurred among them, similarly, had the ships gone South with their "tween" decks crowded with passengers cases must have occurred. This enforced stay on Prison Island gives rise to a great deal of grumbling and discontent among the passengers, and some care and patience is required in dealing with them. The island is, however, ideally situated for this work, the quarters are good and the ration per person ample and of good quality. This repeated quarantining of large numbers of passengers is a great strain on the personnel and resources of the Public Health Department. Two or three Sanitary Inspectors and a Dispenser have to be detached from their work in the town. Rations have to be purchased in large quantities and examined and despatched daily, and generally a great deal of clerical work is involved in making lists of passengers, their nationalities and particular lists according to their caste and religion. A great deal of the Medical Officer of Health's time is taken up in journeys to and from the island. Consequently the routine work of the Health Department is dislocated and general sanitation is to some extent neglected. The other mail boat arriving in quarantine was the "Llanstephan Castle" from Durban for England. The Second Officer developed Small-pox a few days before arriving in Zanzibar. He was removed to the Infectious Diseases Hospital at Gulioni and his cabin and adjoining cabins disinfected and vaccine lymph was supplied to the ship's doctor.

Extensive repairs and alterations were carried out at the Quarantine Station during the year. The general condition of the buildings is now satisfactory. The total number of passengers quarantined was 2,012, as compared to 1,731 in 1920. The station was vacant during the months of July, November, and December.

[illegible]

Bombay
+
Durban

# TABLE III.

## PORT SANITATION RETURN, 1921.

| | Arrivals | | | Restricted ships | Ships claytonised | Passengers landed | Passengers under surveillance | Number of persons vaccinated | Persons placed in quarantine |
|---|---|---|---|---|---|---|---|---|---|
| | British | Foreign | Total | | | | | | |
| *Steamers*— | | | | | | | | | |
| January .. | 19 | 5 | 24 | 1 | 1 | 970 | 151 | 366 | 415 |
| February .. | 20 | 4 | 24 | 1 | 1 | 1048 | 361 | .. | 301 |
| March .. | 27 | 8 | 35 | .. | .. | 987 | 507 | 177 | .. |
| April .. | 14 | 3 | 17 | 2 | 2 | 1029 | 541 | 292 | 582 |
| May .. | 18 | 5 | 23 | .. | .. | 1079 | 559 | 71 | .. |
| June .. | 19 | 5 | 24 | 2 | 1 | 794 | 431 | .. | 566 |
| July .. | 25 | 8 | 33 | .. | .. | 1162 | 409 | 214 | .. |
| August .. | 25 | 4 | 29 | 1 | 1 | 1121 | 280 | 261 | 3 |
| September .. | 26 | 5 | 31 | .. | .. | 898 | 192 | 243 | .. |
| October .. | 32 | 8 | 40 | 1 | 1 | 1279 | 358 | 360 | 145 |
| November .. | 30 | 7 | 37 | .. | .. | 1185 | 278 | .. | .. |
| December .. | 33 | 8 | 41 | .. | .. | 1285 | 330 | .. | .. |
| *Men of War* .. | 1 | 2 | 3 | .. | .. | .. | ... | .. | .. |
| Total .. | 289 | 72 | 361 | 8 | 7 | 12837 | 4397 | 1984 | 2012 |
| Total for 1920 .. | 246 | 60 | 306 | 4 | 81 | 12059 | 3391 | 2119 | 1704 |
| *Dhows*— | | | | | | | | | |
| January .. | 166 | 43 | 209 | .. | .. | 619 | .. | 601 | .. |
| February .. | 132 | 178 | 310 | .. | .. | 746 | 18 | 1769 | .. |
| March .. | 164 | 149 | 131 | .. | .. | 911 | 32 | 2342 | .. |
| April .. | 121 | 39 | 160 | .. | .. | 793 | 19 | 848 | .. |
| May .. | 98 | 33 | 131 | .. | .. | 500 | 17 | 356 | .. |
| June .. | 98 | 21 | 119 | .. | .. | 417 | 18 | 136 | .. |
| July .. | 106 | 28 | 134 | .. | .. | 498 | 12 | .. | .. |
| August .. | 106 | 26 | 132 | .. | .. | 390 | 11 | .. | .. |
| September .. | 144 | 44 | 188 | .. | .. | 461 | 13 | ... | .. |
| October .. | 137 | 41 | 178 | .. | .. | 572 | 19 | ... | .. |
| November .. | 131 | 27 | 158 | .. | .. | 524 | 12 | ... | .. |
| December .. | 118 | 45 | 163 | 1 | 1 | 509 | 16 | .. | 10 |
| Total .. | 1521 | 674 | 2195 | 1 | 1 | 6940 | 187 | 6052 | 10 |
| Total for 1920 .. | 1693 | 530 | 2223 | 2 | 2 | 7009 | 482 | 482 | 27 |

Four ships remained in voluntary quarantine in the month of September and one in October.

## TABLE IV.

Return of persons quarantined during 1921 :—

| | Remaining | Admitted | TOTAL | Discharged | Died | Remaining | Largest No. on one day | No. of days station occupied | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| January ... | 338 | 415 | 753 | 337 | 1 | 415 | 415 | 5 | s.ss. Taroba & Karagola |
| February ... | 415 | 301 | 716 | 414 | 1 | 301 | 415 | 25 | s.ss. Karagola & Baroda. |
| March ... | 301 | ... | 301 | 301 | ... | ... | 301 | 20 | s.s. Baroda |
| April .. | ... | 582 | 582 | 186 | ... | 396 | 582 | 22 | s.s. Karagola |
| May ... | 396 | ... | 396 | 396 | ... | ... | 396 | 2 | ,, |
| June ... | ... | 566 | 566 | 566 | ... | ... | 566 | 17 | ,, |
| August ... | ... | 3 | 3 | ... | ... | 3 | 3 | 12 | s.s. Lanstephan Castle |
| September ... | 3 | ... | 3 | 3 | ... | ... | 3 | 9 | ,, ,, |
| October ... | ... | 145 | 145 | 145 | ... | ... | 145 | 5 | s.s. Karoa |
| Total ... | 1453 | 2012 | 3465 | 2348 | 2 | 1115 | 2826 | 117 | |

## PART V.—SUPPRESSION OF INFECTIOUS DISEASES.

*Small-Pox.*—The total number of cases during the year was 158, of which 56 died—seven being reported after death. Of the 158 cases, 122 were treated in Gulioni Infectious Diseases Hospital, of which 40 died. Twenty-nine cases were segregated and treated in out-districts, of which nine died and seven cases were reported after death. Two hundred and forty-three contacts were kept under observation in Gulioni Hospital, of which 18 developed the disease; these are included in 122 cases treated in Gulioni Infectious Diseases Hospital. In one instance where a case was reported after death 14 contacts were removed to the Observation Camp, of which three developed the disease, and in another instance out of three contacts removed with a case, two developed the disease.

It is interesting to note that out of the 158 cases, 79 were completely unprotected by vaccination, of which 41 died, giving a death rate of 51.9 per cent. Thirty-four had been vaccinated years previously, but not re-vaccinated, of which 10 died, giving a death rate of 26.4 per cent. Forty-five had been recently vaccinated, of which five died, giving a death rate of 11.1 per cent. At first sight it would appear that the recently vaccinated were less protected as regards incidence than those vaccinated years previously, but as the great majority of these were vaccinated during the incubation period of the disease this was too late to develop any protection although there was a successful reaction. In only two cases did death occur in a recently successfully vaccinated case. One was a cook employed in the Infectious Diseases Hospital and the other an employee of the Public Health Department, who was engaged in removing Small-pox cases from their homes to the Hospital and removing dead bodies to the burial ground. The protective influence of vaccination throughout the whole course of the epidemic was striking, and I attribute the limited number of cases largely to extensive vaccination of the populace with a potent lymph. Owing to the war and the shortage of Medical Officers the population of Zanzibar Town and Island were largely " unprotected " as regards Small-pox.

*Origin and Cause of the Epidemic.*—The infection would appear to have been introduced by a British Indian who landed off the British India Steam Navigation Co.'s ship " Taroba " on 21st March and went straight to Mwera, seven miles from the town, with his family. No cases had occurred on the " Taroba " during the voyage from India, and the deck passengers were allowed to land under the usual surveillance, and their personal belongings were claytonised as usual. This man reported daily and stated that his family were well, but owing to the distance he had not brought them for inspection. Unfortunately this was accepted as a valid excuse. On April 22nd, the Assistant District Commissioner in charge of the Mwera district was informed by a police sergeant that the man's wife had died and been buried secretly and that his child and the child of another Indian were ill. These children were traced and found to be suffering from Small-pox. The cases and contacts were removed to Gulioni Infectious Diseases Hospital and subsequently the parents were both fined the maximum penalty, Rs. 50. This penalty was subsequently raised to Rs. 1,000. The outbreak centred round Mwera, but spread east and west along the Zanzibar-Mwera-Chwaka road, and north and south along the native quarters running through the plantations and villages. The number of cases each week was limited, and in almost every case the source of infection could be traced. An outbreak, which was fortunately limited to only 10 known cases, occurred at Tumbatu Island in the north in July, and a similar outbreak, also limited to 11 known cases, in the Makunduchi district in the south in November. In both these outbreaks the infection was evidently carried by dhows. The largest number of cases reported in any one week were during the last three weeks of September and were 10, 11, and 12 respectively. It was at this time, too, that cases occurred in the bazaars among Indians in the crowded lodging-houses, and it was feared that a serious epidemic in the town might ensue with heavy loss of life and great financial loss to the trade of the port. Fortunately this did not occur and the disease gradually diminished, the last case during the year occurring on the 19th December.

### *Measures Adopted to Deal with Outbreak.*—

1. The notification of Small-pox is compulsory. All Administrative Officers, headmen of districts and police were requested to be on the watch for cases, and a reward of Rs. 5 was paid to any of the latter reporting a case.

   The total number of cases reported in the town and island were 13. It is probable that although a good many escaped observation this represents a fair proportion of the total.

2. Cases, together with their contacts, were immediately removed to the Infectious Diseases Hospital. In this work the motor-car belonging to the Public Health Department proved of great use. Where, owing to distance and lack of roads, this could not be done, the case was isolated locally under the charge of the headman.

3. A Sanitary Inspector, with a staff of three boys, was immediately sent to the house, which was disinfected with fluid disinfectant and cleared. Articles capable of conveying infection, such as old clothes, native mats and mattresses, were burnt, compensation being paid for the articles destroyed.

   Tumble-down native huts were also burnt and compensation paid. Stone-built houses, in which the rooms could be properly closed, were disinfected by sulphur fumigation.

4. The neighbouring houses were inspected and examined for cases and persons requiring vaccination.

   When cases occurred in the bazaars all the houses in the same street were inspected daily, as well as all Indians and Native lodging-houses and so-called hotels.

5. Vaccination was performed as soon as possible on all persons living in the neighbourhood of the reported case. In the out-districts arrangements were made through the Senior Commissioner for the headmen to bring up all their people for vaccination. Two native vaccinators accompanied the Senior Commissioner on his tour throughout the South of the Island and vaccinated over 1,000 people. When cases occurred in the bazaars the town was divided into districts and every available member of the staff was put on the vaccination work; house-to-house visits being made. In this way the greater proportion of the susceptible populace was vaccinated speedily. Fortunately a large weekly supply of potent lymph was obtainable from the Bacteriological Laboratories at Dar-es-Salaam, and I must record my thanks to Dr. Butler, Director of Laboratories, for his invaluable assistance in supplying large quantities of effective lymph at a critical time. I largely attribute the decrease of what might have been a serious epidemic to the rapid production of a large protected population.

The subjoined table gives the number of vaccinations performed.

TABLE V.

Number of persons vaccinated during the year 1921 :—

| | Town | Steamer | Dhow | Prison Island | Mwera | Chwaka | Mkokotoni | Total |
|---|---|---|---|---|---|---|---|---|
| January ... | 646 | 366 | 601 | 333 | | | 43 | 1989 |
| February ... | 190 | — | 1769 | — | | — | 73 | 2032 |
| March ... | 513 | 177 | 2342 | 236 | — | | 90 | 3358 |
| April ... | 435 | 292 | 848 | 558 | 589 | | 94 | 2816 |
| May ... | 1279 | 71 | 356 | — | 1135 | — | 83 | 2924 |
| June ... | 892 | — | 136 | 509 | 2796 | 257 | 280 | 4870 |
| July ... | 2587 | 214 | — | — | 1320 | 1325 | 1124 | 6570 |
| August ... | 1295 | 261 | — | — | 342 | 183 | 691 | 2772 |
| September ... | 5083 | 243 | — | — | — | | 503 | 5829 |
| October ... | 6753 | 360 | — | 152 | — | — | 221 | 7486 |
| November ... | 2725 | — | — | — | — | 628 | 264 | 3617 |
| December ... | 1183 | — | — | — | — | 2472 | 231 | 3886 |
| Total ... | 23581 | 1984 | 6052 | 1788 | 6182 | 4865 | 3697 | 48149 |

NOTE:—Out of 23,581 vaccinations performed in Town 15,340 were positive, 6,358 negative, and 1,856 unknown.

The exact result of the vaccinations performed in shamba districts could not be obtained, but there is no doubt that over 50% proved positive.

*Treatment of Cases Admitted to Gulioni Hospital.*—All cases as a routine measure were painted over thrice daily with a five per cent. solution permanganate of potash, as suggested by Colonel Balfour. This was markedly beneficial in reducing the suppuration, smell and scurving in definitely discrete cases, but was of less use in confluent cases and those profuse discrete cases where it is difficult to say whether the case is discrete or confluent. In these the suppuration, sloughing and destruction of skin are frequently so great that the patient is covered with foul, evil-smelling sores and is in fact in precisely the same state as a patient suffering from superficial burns with the additional disadvantage that the new surfaces are bound to be septic, whereas in burns treated immediately the sepsis may be prevented. Consequently many patients who have got past the acute toxæmia of Small-pox die of shock and septicæmia. Wasting and loss of flesh at this stage is very marked, the patients almost appearing to shrink before one's eyes. I found that great benefit was derived by placing these patients in a long bath filled with five per cent. permanganate solution at body temperature for ten minutes to a quarter of an hour twice daily. It greatly reduced smell and sloughing and rendered the patients much more comfortable, and appeared, in one or two cases at any rate, to save life. It is difficult to draw a hard and fast line between profuse and discrete and confluent cases, but after seeing many cases of Small-pox in Zanzibar and Uganda I cannot say that I have ever seen a real confluent case recover. The natives say that if the skin across the bridge of the nose splits the patient will die, but this splitting and bursting of the skin here is characteristic of severe confluent cases. After the stage of suppuration had ceased and the scales were drying off the patient was anointed with carbolic oil. This greatly hastened the detachment of the scabs. No patient was discharged until all scabs were off, particular attention being paid to the palms and soles. No other form of special treatment was tried. The patients were attended by the Native Hospital staff, who worked well and conscientiously did their best for those in their charge. The near relatives of the patients usually remained with them and helped to look after them. The following tables give full particulars of the disease :—

## TABLE VI.

### SMALL-POX.

### DISTRICTS.

| | |
|---|---|
| On steamers and dhows in harbour ... | 7 |
| Town Districts ... ... ... | 52 |
| Developed among contacts in Segregation Camp ... ... ... | 18 |
| Mwera District ... ... ... | 43 |
| Chwaka District ... ... ... | 25 |
| Mkokotoni District, including Tumbatu Island ... ... ... | 13 |
| Total | 158 |

### AGES.

| | |
|---|---|
| Under 1 year | 1 |
| 1 to 5 | 22 |
| 6 to 10 | 16 |
| 11 to 20 | 25 |
| 21 to 30 | 41 |
| 31 to 40 | 39 |
| 41 to 50 | 5 |
| 51 to 60 | 2 |
| Unknown | 7 |
| Total | 158 |

### NATIONALITIES.

| | |
|---|---|
| Swahili | 122 |
| Hindoo | 9 |
| Ismaili Khoja | 8 |
| Gazija | 6 |
| Mohammedan Indian | 4 |
| Memon | 2 |
| Arab | 2 |
| Kikuyu | 1 |
| Mnyamwezi | 1 |
| Shihiri | 1 |
| Goan | 1 |
| European | 1 |
| Total | 158 |

Of these 96 were males and 62 females.

## TABLE VII.

Table showing particulars of deaths due to Small-pox, of which there were 56.

| AGES. | |
|---|---|
| Under 1 year | 1 |
| 1 to 5 | 2 |
| 6 to 10 | 4 |
| 11 to 20 | 2 |
| 21 to 30 | 7 |
| 31 to 40 | 19 |
| 41 to 50 | 13 |
| 51 to 60 | 2 |
| 61 to 70 | 1 |
| Unknown | 5 |
| Total | 56 |

| NATIONALITIES. | |
|---|---|
| Swahili | 44 |
| Gazija | 5 |
| Ismaili Khoja | 2 |
| Kikuyu | 1 |
| Arab | 1 |
| Hindoo | 1 |
| Memon | 1 |
| Shihiri | 1 |
| Total | 56 |

Of these 32 were males and 24 females.

## TABLE VIII.

Table showing particulars of cases treated in Gulioni Infectious Diseases Hospital.

| AGES. | |
|---|---|
| Under 1 year | 1 |
| 1 to 5 | 12 |
| 6 to 10 | 8 |
| 11 to 20 | 16 |
| 21 to 30 | 17 |
| 31 to 40 | 46 |
| 41 to 50 | 17 |
| 51 to 60 | 4 |
| 61 to 70 | 1 |
| Total | 122 |

| NATIONALITIES. | |
|---|---|
| Swahili | 90 |
| Hindoo | 7 |
| Ismaili Khoja | 7 |
| Gazija | 7 |
| Mohammedan | 4 |
| (British) European | 1 |
| Memon | 1 |
| Kumbar | 1 |
| Arab | 1 |
| Goan | 1 |
| Mnyamwezi | 1 |
| Kiguio | 1 |
| Total | 122 |

Of these 85 were males and 37 females.

## TABLE IX.

Table showing particulars of deaths due to Small-pox in Gulioni Infectious Diseases Hospital.

| AGES. | |
|---|---|
| Under 1 year | 0 |
| 1 to 5 | 1 |
| 6 to 10 | 2 |
| 11 to 20 | 0 |
| 21 to 30 | 6 |
| 31 to 40 | 17 |
| 41 to 50 | 11 |
| 51 to 60 | 2 |
| 61 to 70 | 1 |
| Total | 40 |

| NATIONALITIES. | |
|---|---|
| Swahili | 33 |
| Gazija | 5 |
| Kikuyu | 1 |
| Ismaili | 1 |
| Total | 40 |

Of these 25 were males and 15 females.

I desire to express my appreciation of the way the whole of the Health Department staff worked during the course of this outbreak and by their willing labour at all times of the day helped to avert what might have been a serious epidemic with heavy loss of life and loss of trade of the port.

My thanks are also due to Dr. L. A. Andrade, C.M.G., Senior Commissioner, for his unremitting help in dealing with the outbreak, and using his influence with the natives to submit to vaccination at Makunduchi in the Mwera district; also to Mr. G. W. Turner, Acting Assistant District Commissioner, whose knowledge of the natives and the districts was of the greatest assistance.

*Other Infectious Diseases.*—The Town and Island were very free from other infectious diseases throughout the year. The following table shows cases and deaths reported and registered during the year as compared with 1920 :—

TABLE X.

| DISEASES. | 1920. | | 1921. | | REMARKS. |
|---|---|---|---|---|---|
| | Cases. | Deaths. | Cases. | Deaths. | |
| Beri-Beri ... | ... | ... | ... | 1 | The deceased was a Mainlander. |
| Black-Water Fever ... | ... | 3 | 5 | 3 | One was a K.A.R. man and two Indians, all recent arrivals from the Mainland. |
| Derebro-Spinal Fever.. | 1 | 1 | ... | ... | |
| Cysentery ... | ... | 9 | ... | 1 | |
| Influenza ... | ... | 1 | ... | ... | |
| Leprosy ... | 17 | 7 | 13 | 12 | |
| Measles ... | ... | 6 | ... | 7 | |
| Pneumonia ... | ... | 25 | ... | 24 | |
| Tetanus ... | ... | 2 | ... | 2 | |
| Tuberculosis ... | ... | 41 | ... | 48 | |
| Variola ... | 7 | 1 | 158 | 56 | 13 occurred in shamba districts. |

It is to be feared that tuberculosis returns by no means include all cases and deaths due to tuberculosis. That tuberculosis is prevalent in Zanzibar is certain, and is, I think, increasing both among Indians and natives. Thus of 128 sputa examined during the year 40, or slightly over 31 per cent., showed for tubercle bacilli. When it is remembered that the bacilli are only found in marked cases, and probably at least half of the negative cases were tuberculosis and, further, that these cases only represent cases which come under the care of a Medical man, some idea of the prevalence of tuberculosis will be given. With the present influx of immigrants and the limited housing accommodation it is difficult to prevent overcrowding. It is to be regretted that the

are there no [illegible] isolation [illegible]

This is [illegible] of the [illegible] Kenya [illegible] generally

average poor-class Indian is utterly deficient in any sense of hygiene. To shut out all light and air, to crowd together, to spit freely and constantly all over the place, whether indoors or out, seem to be ingrained habits with them. They have a complete disregard of sanitation laws for the public welfare and are quite prepared to hide a case of infectious disease if they think that its notification to the authorities will cause them inconvenience, as was shown in the case of Small-pox concealed by Indians in the bazaars. The natives, too, are equally fond of stuffiness, overcrowding and expectoration, and, although when they live in their own mud and wattle huts they make some attempt at cleanliness, they soon lose this when they crowd into the already overcrowded bazaars. The houses are tall and crowded together, with insufficient light and ventilation. The area on which Zanzibar city is built is far too congested and every effort should be made to preserve open spaces remaining and to prevent the erection of new buildings in crowded areas. When plans are submitted for alteration of or additions to dwelling-houses, they are inspected by the Medical Officer of Health and increase of light and ventillation are insisted on. In practically every case it is found that the windows and doors are insufficient for proper light and ventilation. Consequently the conditions for the spread of tuberculosis are ideal, and the whole subject is one that should be enquired into at the earliest opportunity. I also think the time has come when the question of sanatorium treatment for tubercular cases should be considered. At present some are treated in the Native Hospital (a most unsuitable place for phthisical patients and a danger to the nurses, attendants and patients), the remainder in their homes, where they are a source of infection to others. In a sanatorium they are isolated from healthy people, and they are taught how a consumptive can live with improvement to his own health and with safety to his friends and relatives.

*Ankylostomiasis.*—Sixty-five per cent. of all stools examined during the year and 70 per cent. of the stools of prisoners admitted during 1921 were found infected with ankylostomiasis. It may be fairly assumed that this represents the rate of hookworm infection throughout Zanzibar. This is, I submit, a serious economic problem and one that calls for urgent attention. When one realises the vast amount of unnecessary suffering, the anæmia, the debility and the lethargy and chronic invalidism caused by this complaint, and, further, that superimposed on this in many cases is a chronic malarial infection, one wonders not at the indolence of the native but at his energy under such adverse conditions. Again, one must consider the vast amount of labour lost through inability to work and the amount lost through inefficient work on this account. Economically, therefore, the eradication of this disease would add greatly to the efficiency of the native and largely increase his earning powers. Ankylostomiasis is a preventible disease, but can only be prevented and eradicated with the co-operation of the people themselves. It is therefore necessary to bring home to the Swahili. by instruction and educational propaganda, the nature and cause of the disease, and to induce him to help himself in its prevention and cure. This requires time, patience, and personal influence with the natives and a knowledge of their language, customs and prejudices. It is to be hoped. as time and staff allow, that much good may result from action on the lines suggested at the conference recently held at the British Residency to consider the best means of tackling this important question. and that an effort may be made in Zanzibar to emulate the fine work accomplished by the Rockfeller Institute in other parts of the world similarly afflicted.

## PART VI.—INFECTIOUS DISEASES HOSPITAL.

This was in charge of a Dispenser with a staff of boys. When necessary, daily visits were paid by the Medical Officer of Health. The following table gives the number of cases, deaths and diseases treated throughout the year.

TABLE XI.

| Diseases | Admitted | Discharged | Died | Remaining |
|---|---|---|---|---|
| Chicken-pox .. | 1 | 1 | .. | .. |
| Debility .. | 1 | 1 | .. | .. |
| Measles .. | 1 | 1 | .. | .. |
| Small-pox .. | 122 | 81 | 40 | 1 |
| Contacts .. | 243 | 243 | .. | .. |
| Total .. | 368 | 327 | 40 | 1 |

At the end of the year the Public Works Department were engaged in erecting a new Thresh Disinfector. The commencement of this work was delayed on account of the numerous cases of Small-pox in the Hospital. This disinfector when installed should prove of great use in future epidemics.

## PART VII.—BACTERIOLOGICAL AND PUBLIC HEALTH LABORATORIES.

There was a great increase in the work done during the year. Thus the number of blood films examined was 1,086 as against 288 in 1920; stools examined, 1,378 as against 805 in 1920; Vaccine prepared, 20 as against 4 in 1920; Wasserman's prepared, 70 as against 6 in 1920.

Twenty-seven samples of milk from the town dairies, 36 samples of mineral waters from the different soda-water factories, and 17 samples of water were analysed during the year.

The increase in the number of blood films and stools was due to the routine examination of the blood of the school children and the blood and stools of all prisoners admitted to the jail.

The heavy incidence of ankylostomiasis infection in Zanzibar is shown in the fact that 65 per cent. of all stools examined are infected. As the incidence rate throughout both islands is probably at least as high, if not higher, it is evident that ankylostomiasis must cause an enormous amount of chronic illness, invalidism and inefficient labour.

Twenty-nine per cent. of blood films examined were positive for malaria. The great majority of these were routine examinations and not acute cases, where one would expect to find parasites. This is a fairly high percentage, as most of the cases come from the town itself in which it is very rare to find anopheles, but, of course, a good proportion may have brought their infection with them. The percentage of sputa showing tubercle bacilli is 31.5 per cent. This has already been commented on. 29%

31%

# TABLE XII.

## BACTERIOLOGICAL LABORATORY RETURN FOR THE YEAR 1921.

**BLOOD**

| | Positive | Negative |
|---|---|---|
| Filaria ... | 1 | 3 |
| Obermeier's Spirllum ... | ... | ... |
| Kala Azar ... | ... | ... |
| Haemaglobin ... | ... | ... |
| Differential Counts ... | 6 | 0 |
| Arneth Counts ... | ... | ... |
| Widal's Test ... | ... | ... |
| Trypanosoma ... | 0 | 3 |
| Wasserman's ... | 23 | 47 |
| Leishman's Donovan Bodies ... | 0 | 1 |
| Malaria ... | 316 | 763 |

| Malaria ... | ... | ... |
|---|---|---|
| St. | Bt. | Q |
| 237 | 78 | 1 |

**URINE**

| | Positive | Negative |
|---|---|---|
| Sugar ... | 10 | 1 |
| Albumin ... | ... | ... |
| Casts ... | ... | ... |
| Bilharzia ... | 5 | 11 |
| Urea ... | ... | ... |
| Catheterial Examination ... | .. | ... |
| B. Coli ... | 4 | 1 |
| Others:— | | |
| Gonococci ... | 14 | 14 |
| Routine Examination ... | 28 | ... |
| Filaria Embryo | 0 | 1 |
| Urethral smear for Gonococci ... | 8 | 7 |
| Cultural Examination for B. Coli and Pyocyaneus | 1 | 0 |

**FAECES**

| | Positive | Negative |
|---|---|---|
| Amœbæ coli ... | 23 | 28 |
| Ankylostoma ... | 909 | 331 |
| Ascaris ... | 74 | 6 |
| Tænia ... | 2 | 0 |
| Other Parasites ... | 4 | 0 |
| Pus ... | ... | ... |
| Blood ... | ... | ... |
| B. Shiga ... | ... | ... |
| Cultural Examination ... | 1 | 0 |
| Bilharzia ... | ... | 1 |
| Total Negative ... | ... | 366 |

**SPUTUM**

| | Positive | Negative |
|---|---|---|
| Tubercle Bacilli... | 40 | 75 |
| Pneumo Cocci ... | 3 | 0 |
| Micro Cocci Catarrhalis ... | 6 | 0 |
| Cultural Examination ... | ... | ... |
| Others ... | 3 | 1 |

**NASAL SECRETIONS**

| | Positive | Negative |
|---|---|---|
| Leprosy ... | 5 | 14 |

Rat Examination

| | Pos. | Neg. |
|---|---|---|
| Spleen smears of rats examined for B. Pests ... | ... | 9101 |

Miscellaneous

| | Pos. | Neg. |
|---|---|---|
| Scraping from Ulcer for Spiro: palli: ... | 1 | 11 |
| Pus for Staphylococci and Streptococci ... | 1 | 1 |
| Smear of Ulcer for Leishman's D. bodies ... | 1 | 2 |
| Spleen smears for Leishman's D. bodies ... | 0 | 2 |
| Smears from Asceptic Fluid T. B. ... | 0 | 1 |
| Scraping from Ulcer for Tenia | 0 | 1 |

**VACCINES**

| | Number |
|---|---|
| Staphylococci ... | 7 |
| Streptococci ... | 1 |
| Gonococci ... | 5 |
| B. Coli ... | ... |
| Shiga ... | ... |
| Catarrhalis ... | ... |
| Others ... | 6 |
| Chicken Cholera | 2 |

**CHEMICAL**

| | Number |
|---|---|
| Milk ... | 27 |
| Water ... | 17 |
| Foodstuffs ... | ... |
| Beverages ... | 8 |
| Tinned Provision | ... |
| Minerals ... | ... |
| Bacteriological and Chemical Examination ... | 36 |
| Legal Cases ... | 5 |
| Others ... | 28 |

Pathological Examination

| | Malignant | Innocent |
|---|---|---|
| Section of Ovaris Cyste ... | 0 | 1 |
| Lymph gland for T. B. ... | 0 | 1 |

REMARKS:—Water for Bacteriological Examination...1. Total number of Private Cases examined during the year...395.

## PART VIII.—SCHOOL MEDICAL SERVICE.

During the year 1921 a beginning was made with a School Medical Service. This consisted of the three following sections :—

- (*a*) Weekly medical inspection of the school children by the Medical Officer of Health.
- (*b*) Weekly lectures on hygiene to the school teachers by the Medical Officer of Health and the Economic Biologist.
- (*c*) The school dispensary was attended twice weekly by a Sub-Assistant Surgeon. During the holidays the work, of course, ceased.

Owing to the many calls on the time of the Medical Officer of Health, neither the inspections nor the lectures were by any means regular. A preliminary survey, however, was made of all the children attending the Government Central School. The facts obtained will be of use in the future, when it is hoped, with an appointment of an Assistant Medical Officer of Health, to extend the work and include if possible other schools than the Government Central School.

The attached table gives the results of the examination of 400 children of different nationalities throughout the year. The nationalities are Indians, (which include the various castes represented in Zanzibar), Arabs (including Zanzibar, Pemba, and Muscat Arabs), Africans (including all the numerous tribes represented in Zanzibar), and Comorians, the majority being, of course, Swahili, and there are a few Persians.

The three principal races are Indians, Arabs and Africans (Swahili), of these physically the Africans are the strongest and best developed, the Indians are physically better developed than the Arabs, who, taken as a whole, have a poor physical development, probably due to their heavy infection rate with malaria.

As regards cleanliness, there is no doubt that the Africans and Comorians are the cleanest, and the Arabs cleaner than the Indians. It will be noted that in no case were lice or nits found in Africans, only once in Arabs, but that 14 Indians were found to have verminous heads.

Defects of vision are commonest in Indians and Arabs, as are defective teeth. It is interesting to note that in no single case was any cardiac abnormality noted, nor was there any child suffering from middle ear disease, a striking contrast to children belonging to an English Board School. The incidence of malarial infection is high, 38.5 per cent. had enlarged spleens, and 25.5 per cent. showed malarial parasites in their blood. The spleens varied in size ranging from a typical "ague cake" reaching to the unbilious to one barely palpable. The heaviest incidence is in the Arab children, the spleen rate being 86 per cent. children under 15, and the parasites rate in the same children being 50 per cent. respectively. The majority of these children were not born in Zanzibar town, but come from Pemba or country districts in Zanzibar, whilst a certain proportion came from Muscat.

There is, in my opinion, no doubt that the health of these Arab children is adversely affected by malaria. They are frequently anæmic, undersized and lethargic. Their average height and weights are less than that of the other nationalities examined, and their physique poorer. Most of them show numerous round cicatrices over their upper abdomen and spleen region, due to the barbarous habit of cauterizing with hot copper coins to relieve the pain and swellings. In a considerable proportion of these children a concurrent ankylostome infection is probable, but it was not found practical to obtain stools from them for examination. An endeavour will be made in the future when time permits to make routine examinations of the stools of all the school children.

The Indian children also who show evidence of malaria are usually found, on being questioned, to have lived in other localities than Zanzibar town. Nevertheless there remains a small proportion of children who appear to have contracted their infection in Zanzibar town itself, despite the rarity with which anopheles are found in the area.

The Africans chiefly come from N'gambo, the native quarter, in which it is also very difficult to find anopheles, but they probably spend periods of time in the districts.

It has always been considered that Zanzibar town, except perhaps for a short period after the rains, is malaria free, whilst the surrounding country is intensely malarious. It would appear from the above statistics that, although this is true in the main, there is more malaria in the urban area than is suspected. For a certain proportion of these children must have been infected in the town, and the whole subject needs further investigation. The attached table gives the results of the examination, and there is nothing that calls for further comment.

It should be added that three out of the total were found to be suffering from inguinal hernia, three from gonorrhœa and 14 had enlarged tonsils with adenoids, but in none of these latter was the condition more than slight.

Those requiring anti-malarial treatment were put on the quinine register. Those with defective sight were examined by the Principal Medical Officer, who prescribed suitable glasses. The others requiring it received appropriate treatment.

## TABLE XIII.

Medical inspection of children in Government Central School, Zanzibar. The children were divided into two sections—under 15 years, and 15 years and over. The following table gives the particulars:—

| | | INDIAN. | | AFRICAN. | | COMORO. | | ARAB. | |
|---|---|---|---|---|---|---|---|---|---|
| | | Under 15 years. | Over 15 years. | Under 15 years. | Over 15 years. | Under 15 years. | Over 15 years. | Under 15 years. | Over 15 years. |
| Eyesight | Normal | 72 | 12 | 58 | 15 | 45 | 10 | 108 | 13 |
| | Defective | 15 | 3 | 10 | 1 | 7 | ... | 26 | 5 |
| Heart | Normal | 87 | 15 | 68 | 16 | 52 | 10 | 134 | 18 |
| | Defective | ... | ... | ... | ... | ... | ... | ... | ... |
| Teeth | Normal | 79 | 15 | 67 | 15 | 50 | 10 | 127 | 17 |
| | Carious | 8 | ... | 1 | 1 | 2 | ... | 7 | 1 |
| Digestive Organs | Normal | 80 | 15 | 66 | 15 | 51 | 10 | 131 | 17 |
| | Defective | 7 | ... | 2 | 1 | 1 | ... | 3 | 1 |
| Spleen | Normal | 63 | 8 | 50 | 11 | 46 | 9 | 72 | 12 |
| | Enlarged | 24 | 7 | 18 | 5 | 6 | 1 | 62 | 6 |
| Small-pox | Not had | 85 | 15 | 66 | 13 | 50 | 8 | 131 | 16 |
| | Had | 2 | ... | 2 | 3 | 2 | 2 | 3 | 2 |
| Lungs | Normal | 86 | 15 | 68 | 16 | 51 | 10 | 134 | 18 |
| | Diseased | 1 | ... | ... | ... | 1 | ... | ... | ... |
| Nose and Ears | Normal | 87 | 15 | 67 | 16 | 51 | 10 | 134 | 18 |
| | Defective | ... | ... | 1 | ... | 1 | ... | ... | ... |
| Malaria Parasite in Blood | Present | 15 | 3 | 25 | 2 | 10 | 2 | 46 | 5 |
| | Absent | 72 | 12 | 43 | 14 | 42 | 8 | 88 | 13 |
| Vaccination Marks | Present | 82 | 15 | 60 | 16 | 46 | 10 | 118 | 17 |
| | Absent | 5 | ... | 8 | ... | 6 | ... | 16 | 1 |
| Verminous Heads | | 14 | ... | ... | ... | ... | ... | 1 | ... |

A Sub-Assistant Surgeon attended the school twice weekly to see any children requiring treatment for minor ailments. The work done is shown in the following table.

### TABLE XIV.

Cases treated at the Government School Dispensary during the year 1921 :—

| | |
|---|---|
| Abscess | 3 |
| Boils | 25 |
| Bronchial Catarrh | 152 |
| Constipation | 133 |
| Fever | 33 |
| Jigger | 41 |
| Rheumatism | 9 |
| Scabies | 12 |
| Orchitis | 4 |
| Ulcers | 193 |
| Whitlow | 3 |
| Minor Diseases | 89 |
| Total | 697 |

Lectures on Hygiene to School Teachers were given weekly in term time by the Medical Officer of Health and the Economic Biologist; a course of 20 lectures being given during the year. These lectures were of an elementary character and were delivered in English. The synopsis of lectures is below :—

I. Nature and causation of disease.
Relative of Public Health service to disease.
II. Food supply.
III. Deficiency disease.
Helminthic disease.
IV. The blood.
V. Digestive.
Liver and kidneys.
VI. Ankylostomiasis. Half-hour by Medical Officer of Health.
Life history of Worms and Demonstration. Half-hour by Economic Biologist.
VII. Malaria.
VIII. & IX. Mosquitoes by Economic Biologist.
X. Fleas by Economic Biologist.
XI. Plague.
XII. Small-pox and Vaccination.
XIII. Cholera and Typhoid.
XIV. Tuberculosis.
XV. Filaria. Life history by Economic Biologist.
XVI. Filaria disease by Medical Officer of Health.
XVII., XVIII., XIX. Microscopic slides, magic-lantern slides, Pathological specimens.
XX. Revision.

## PART IX.—POOR AND LEPER ASYLUMS.

The Leper Asylum and the Poorhouse at Walezo are under the charge of the Roman Catholic Mission, one sister looking after the lepers, and one the inmates of the poorhouse. A weekly visit is paid by the Medical Officer of Health or a Sub-Assistant Surgeon. Owing to the distance (four miles) and pressure of routine work, and the time taken up dealing with the outbreak of Small-pox, it was impossible for the Medical Officer of Health to pay regular visits or to undertake any definite lines of treatment, either for the lepers or to investigate the numerous complaints of the latter. Fortunately, one has satisfaction of knowing that the inmates are well looked after by the Roman Catholic Sisters, who render devoted service.

The Lloyd Mathews' Memorial Hospital, being considered no longer safe, was demolished during the year..

Work is proceeding at Funzi Island. When the buildings are complete the Pemba lepers and, later, the Zanzibar lepers, will be removed to this one central station.

### TABLE XV.

### WALEZO LEPER ASYLUM, ZANZIBAR.

| Particulars | Males | Females | Total |
|---|---|---|---|
| Remaining on 1st January, 1921 ... | 31 | 47 | 78 |
| Admitted during the year ... | 8 | 5 | 13 |
| Discharged ,, ,, ,, ... | 1 | ... | 1 |
| Died ,, ,, ,, ... | 8 | 4 | 12 |
| Escaped ,, ,, ,, ... | 3 | 3 | 6 |
| Remaining on 31st December, 1921 ... | 27 | 45 | 72 |

### LEPER SETTLEMENTS, PEMBA.

| Particulars | Nduni | Kengeja | Pujini |
|---|---|---|---|
| Average monthly numbers ... | 34 | 24 | 55 |

## WALEZO (SICK) POORHOUSE.

The following table shows the number of paupers treated at the Walezo Poorhouse during the year 1921 :—

### TABLE XVI.

| Particulars | Males | Females | Total |
|---|---|---|---|
| Remaining on 1st January, 1921 .. | 34 | 29 | 63 |
| Admitted during the year, 1921 .. | 90 | 63 | 153 |
| Died do. do. .. | 39 | 31 | 70 |
| Discharged do. do. .. | 43 | 20 | 63 |
| Escaped do. do. .. | 3 | 8 | 11 |
| Remaining at the end of the year .. | 39 | 33 | 72 |

### TABLE XVII.

### Population of Zanzibar and Pemba—Census 1910.

| | Males | Females | Children | Total |
|---|---|---|---|---|
| Zanzibar : | | | | |
| Zanzibar Town ... ... | 15,122 | 14,304 | 5,396 | 34,822 |
| Mwera ... ... | 11,239 | 13,206 | 4,656 | 29,101 |
| Chwaka ... ... | 5,617 | 7,458 | 4,553 | 17,628 |
| Mkokotoni ... ... | 11,013 | 14,242 | 6,818 | 32,073 |
| Total ... | 42,991 | 49,210 | 21,423 | 113,624 |
| Pemba : | | | | |
| Chake Chake ... ... | 10,757 | 13,597 | 8,958 | 33,312 |
| Weti ... ... | 11,416 | 11,002 | 8,307 | 30,725 |
| Mkoani ... ... | 6,290 | 7,295 | 5,487 | 19,072 |
| Total ... | 28,463 | 31,894 | 22,752 | 83,109 |
| Grand Total ... | 71,454 | 81,104 | 44,175 | 196,733 |

## BIRTHS.

(*a*) The total number of Births registered in the Town of Zanzibar during the year 1921, was as follows :—

| | | |
|---|---|---|
| Males, ... | 236 | |
| Females, ... | 243 | |
| | | 479 |
| Still-born ... ... ... | | 26 |
| Total ... | | 505 |

(*b*) Nationalities of Births :—

| | |
|---|---|
| Ismaili Khoja ... | 130 |
| Hindu ... ... | 66 |
| Bohora ... ... | 43 |
| Ithnasheri Khoja ... | 40 |
| Arab ... ... | 37 |
| Memon ... ... | 29 |
| Other Mohammedan Indians ... | 25 |
| Goan ... ... | 22 |
| Swahili ... ... | 18 |
| Other Africans ... | 17 |
| Shihiri ... ... | 16 |
| Gazija ... ... | 11 |
| European ... | 7 |
| Other Indians ... | 4 |
| Baluchi ... ... | 3 |
| Persian ... ... | 3 |
| Parsi ... ... | 3 |
| Mnyamwezi ... | 2 |
| Barawa ... ... | 1 |
| Chinese ... ... | 1 |
| Egyptian ... | 1 |
| Total ... | 479 |

## (*c*) Births registered in the Island of Zanzibar, 1913-1921.

### TABLE XVIII.

| | 1921 | 1920 | 1919 | 1918 | 1917 | 1916 | 1915 | 1914 | 1913 |
|---|---|---|---|---|---|---|---|---|---|
| Town Area ... | 468 | 473 | 341 | 418 | 305 | 296 | 332 | 401 | 576 |
| Mkokotoni Dist. ... | 986 | 1,573 | 720 | 930 | 1,559 | 1,099 | 1,023 | 511 | 634 |
| Mwera ,, ... | 513 | 313 | 313 | 479 | 430 | 490 | 426 | 245 | 287 |
| Chwaka ,, ... | 613 | 600 | 402 | 384 | 392 | 469 | 458 | 190 | 253 |
| Total ... | 2,580 | 2,959 | 1,776 | 2,211 | 2,686 | 2,354 | 2,239 | 1,347 | 1,750 |

## (*d*) Comparative statement of Births and Deaths, 1913-1921.

### TABLE XIX.

| | | 1913 | 1914 | 1915 | 1916 | 1917 | 1918 | 1919 | 1920 | 1921 |
|---|---|---|---|---|---|---|---|---|---|---|
| Town Area | Births | 576 | 401 | 332 | 296 | 305 | 418 | 341 | 473 | 468 |
| | Deaths | 1,128 | 1,317 | 1,008 | 1,168 | 1,255 | 1,359 | 1,180 | 1,083 | 1,076 |
| Districts | Births | 1,174 | 946 | 1,907 | 2,058 | 2,381 | 1,793 | 1,435 | 2,713 | 2,112 |
| | Deaths | 1,983 | 1,821 | 2,212 | 2,089 | 2,235 | 9,615 | 1,983 | 1,958 | 2,185 |

## DEATHS.

(*a*) The number of Deaths registered in the Town of Zanzibar during the year 1921 was :—

| | |
|---|---|
| Males ... ... | 574 |
| Females ... ... | 502 |
| Total ... | 1,076 |

(*b*) Nationality of the deceased :—

| | | | |
|---|---|---|---|
| Swahili ... ... | 549 | Goan ... ... | 4 |
| Shihiri ... ... | 72 | Mbissa ... ... | 4 |
| Comoro ... ... | 63 | Mzigua ... ... | 3 |
| Ismaili Khoja ... | 56 | Makonda ... | 3 |
| Hindu ... ... | 54 | Mnyaturu ... | 2 |
| Arab ... ... | 48 | Manyema ... | 2 |
| Memon ... ... | 41 | Mpemba ... ... | 2 |
| Ithnasheri Khoja ... | 32 | Punjabi (Indian) ... | 2 |
| Bohora ... ... | 27 | Ceylonese ... | 1 |
| Mohammedan (Indian) | 22 | Persian ... ... | 1 |
| Mnyassa ... ... | 14 | Matumubi ... | 1 |
| Mnyamwezi ... | 12 | Mnubi ... ... | 1 |
| Baluchi ... ... | 11 | Anglo-Indian ... | 1 |
| Unknown ... | 10 | Mpare ... ... | 1 |
| Muhiyao ... ... | 8 | Mkikuyu ... | 2 |
| Mainland Native ... | 7 | Mdigo ... ... | 1 |
| Mgindo ... ... | 6 | Makua ... ... | 1 |
| Somali ... ... | 6 | Kavirondo ... | 1 |
| Mzaramu ... | 4 | Mganda ... ... | 1 |
| | | Total ... | 1,076 |

## TABLE XX.

### Return of General Causes of Deaths—Zanzibar Town, 1921.

| Diseases. | Reported by | | Total. |
|---|---|---|---|
| | Qualified Practitioners. | Unqualified Persons. | |
| INFECTIVE DISEASES. | | | |
| Beri-Beri ... ... | 1 | ... | 1 |
| Dysentery ... ... | 1 | 1 | 2 |
| Erysipelas ... ... | 2 | ... | 2 |
| Leprosy ... ... | 12 | ... | 12 |
| Malaria Fever ... ... | 16 | 28 | 44 |
| Carried forward ... | 32 | 29 | 61 |

## TABLE XX—(*Continued*).

## Return of General Causes of Deaths—Zanzibar Town, 1921.

| Diseases. | Reported by |  | Total. |
|---|---|---|---|
|  | Qualified Practitioners. | Unqualified Persons. |  |
| Brought forward ... | 32 | 29 | 61 |
| INFECTIVE DISEASES—(*Continued*). |  |  |  |
| Blackwater ... ... | 3 | ... | 3 |
| Measles ... ... | 1 | ... | 1 |
| Pneumonia ... ... | 24 | 1 | 25 |
| Septicæmia ... ... | 1 | ... | 1 |
| Small-pox ... ... | 43 | ... | 43 |
| Syphilis ... ... | 2 | 2 | 4 |
| Tetanus ... ... | 2 | ... | 2 |
| Tuberculosis ... ... | 35 | 70 | 105 |
| Undefined Fever ... ... | 9 | 82 | 91 |
| Pyæmia ... ... | 1 | ... | 1 |
| GENERAL DISEASES. |  |  |  |
| Anæmia ... ... | 10 | 39 | 49 |
| ,, Pernicious ... | 1 | ... | 1 |
| Diabetes ... ... | 2 | 1 | 3 |
| Rickets ... ... | 1 | ... | 1 |
| Debility ... ... | 26 | 65 | 91 |
| Rheumatism (Chronic) ... | 3 | 37 | 40 |
| Senile Decay ... ... | 10 | 59 | 69 |
| Infantile Debility ... ... | 7 | 11 | 18 |
| Marasmus ... ... | 4 | ... | 4 |
| LOCAL DISEASES. |  |  |  |
| *Diseases of the Nervous System.* |  |  |  |
| Sub-Section I. |  |  |  |
| Meningitis ... ... | 2 | ... | 2 |
| Cerebral Hæmorrhage ... | 4 | ... | 4 |
| Sub-Section II. |  |  |  |
| Apoplexy ... ... | 2 | ... | 2 |
| Paralysis ... ... | 2 | 24 | 26 |
| Epilepsy ... ... | 1 | 2 | 3 |
| Hysteria ... ... | ... | 1 | 1 |
| Convulsion (Infantile) ... | 8 | 20 | 28 |
| Hemiplegia ... ... | 1 | 2 | 3 |
| Carried forward ... | 237 | 445 | 682 |

## TABLE XX—(*Continued*).

## Return of General Causes of Deaths—Zanzibar Town, 1921.

| Diseases. | Reported by |  | Total. |
|---|---|---|---|
|  | Qualified Practitioners. | Unqualified Persons. |  |
| Brought forward ... | 237 | 445 | 682 |
| LOCAL DISEASES—(*Continued*). |  |  |  |
| *Diseases of the Nervous System.* |  |  |  |
| Sub-Section III. |  |  |  |
| Mental Diseases— |  |  |  |
| Dementia ... ... | 2 | 16 | 18 |
| *Diseases of the Circulatory System.* |  |  |  |
| Pericarditis ... ... | 1 | ... | 1 |
| Endocarditis ... ... | 2 | ... | 2 |
| Valvular (Mitral) ... ... | 1 | ... | 1 |
| ,, (Aortic) ... .. | 2 | ... | 2 |
| Arterial Sclerosis .. ... | 1 | ... | 1 |
| Valvular Disease ... ... | 2 | 3 | 5 |
| Heart Failure ... ... | 10 | 1 | 11 |
| Embloism ... ... | 1 | ... | 1 |
| *Diseases of the Respiratory System.* |  |  |  |
| Bronchitis ... ... | 3 | 46 | 49 |
| Broncho-Pneumonia ... | 14 | 34 | 48 |
| Asthma ... ... | 4 | 22 | 26 |
| Bronchitis (Capillary) ... | 1 | ... | 1 |
| ,, (Acute) ... ... | 6 | ... | 6 |
| Bronchial Catarrh ... .. | 2 | 44 | 46 |
| *Diseases of the Digestive System.* |  |  |  |
| Enteritis ... ... | 1 | ... | 1 |
| Appendicitis ... ... | 1 | ... | 1 |
| Hernia (Strangulated) ... | 1 | 2 | 3 |
| ,, (Inguinal) ... ... | 1 | ... | 1 |
| Diarrhœa ... ... | 5 | 60 | 65 |
| Abscess (Hepatic) ... ... | 1 | ... | 1 |
| Cirrhosis (Hepatic)... ... | 3 | 2 | 5 |
| Jaundice ... ... | ... | 1 | 1 |
| Peritonitis ... ... | 5 | ... | 5 |
| Intestinal Obstruction ... | 3 | ... | 3 |
| Inft. Diarrhœa ... ... | 1 | 3 | 4 |
| Carried forward ... | 311 | 679 | 990 |

## TABLE XX—(*Continued*).

## Return of General Causes of Deaths—Zanzibar Town, 1921.

| Diseases. | Reported by | | Total. |
|---|---|---|---|
| | Qualified Practitioners. | Unqualified Persons. | |
| Brought forward ... | 311 | 679 | 990 |
| LOCAL DISEASES—(*Continued*). | | | |
| *Diseases of the Urinary System.* | | | |
| Nephritis (Chronic) ... | 6 | 12 | 18 |
| Uræmia ... ... | 2 | ... | 2 |
| Bright's Disease ... ... | 5 | 1 | 6 |
| *Diseases of the Generative System.* | | | |
| Male Organs— | | | |
| Stricture ... ... | 1 | ... | 1 |
| Scrotum Sloughing ... | ... | 2 | 2 |
| Female Organs— | | | |
| Ovarian Cyst ... ... | 3 | ... | 3 |
| Abortion ... ... | 1 | 1 | 2 |
| Delayed Labour ... ... | 3 | ... | 3 |
| Postpartum Hæmorrhage ... | ... | 1 | 1 |
| Puerperal Septicæmia ... | 3 | ... | 3 |
| Abscess of Breast ... | 1 | ... | 1 |
| Hypertrophy ... ... | ... | 1 | 1 |
| Eclampsia ... ... | 1 | ... | 1 |
| Hæmorrhagic Mole ... | 1 | ... | 1 |
| *Diseases of Connective Tissues.* | | | |
| Cellulitis ... ... | 1 | ... | 1 |
| Abscess ... ... | 2 | ... | 2 |
| Elephantiasis ... ... | 2 | 3 | 5 |
| *Disease of the Skin.* | | | |
| Carbuncle ... ... | 1 | ... | 1 |
| Ulcers ... ... ... | ... | 1 | 1 |
| *Injuries.* | | | |
| General ... ... | 7 | ... | 7 |
| Local ... ... ... | 6 | ... | 6 |
| Surgical Operations ... | 1 | ... | 1 |
| Tumour (Malignant) ... | 3 | ... | 3 |
| *Nematoda.* | | | |
| Filariasis ... ... | 1 | ... | 1 |
| Ankylostomiasis .. ... | 8 | 4 | 12 |
| Tænia (Ulceration)... ... | 1 | ... | 1 |
| Total ... | 371 | 705 | 1076 |

## Part X.—Vital Statistics.

These tables include the census taken in 1920 and the total number of births and deaths registered in the Town Districts and the whole Island during the year. No deductions can be drawn from these tables, however, as they are quite unreliable and must be regarded as approximate only. The reasons for this are the following :—

> All calculations must be based on the census of 1910 and the population has probably considerably increased since then. The registration of births is very unreliable. By law the nearest relatives are bound to report the birth of a child. A certain proportion is so reported in the town districts to the Health Office and in the country districts to the local Sheha, who sends his return to the District Office. It is probable that many fail to report. Moreover, it is the custom of the native women living in the town areas to go to the country districts to be confined. It has been found that the appointment of Birth Inspector for the township, whether native or Indian, is a failure, as these men find it easier to rely upon their imagination for their returns rather than to ascertain the true number of births. The registration of deaths is probably much more accurate, as permission to bury must be obtained before the body can be disposed of, but the causes given for deaths are far from accurate, especially in the country districts, where the information is entirely native. In the town a certain proportion of deaths are reported by Medical Practitioners, but the majority by unqualified persons. Thus, of 1,076 deaths, 371 were reported by qualified men and 705 by the Inspector of Dead, a Sub-Assistant Surgeon attached to this Department. He is most conscientious and reliable in the performance of his duties, and on several occasions has detected cases of Small-pox after death. But, as he merely views the body and obtains a history (probably inaccurate) from the relatives, it is impossible for him to give a reliable diagnosis. That many of these natives die of Phthisis seems only too likely, as the commonest history is cough, fever and wasting death. Other common causes of death are Diarrhœas or Dysenteries and respiratory, such as Bronchitis and Pneumonia, probably frequently due to Tuberculosis, although Idiophatic Pneumonia appears to be frequent among natives and Indians.

It will thus be seen that accurate findings cannot be deduced from the statistical tables under present conditions.

### Deaths registered in the Island of Zanzibar, 1913-1921.

### Table XXI.

| | 1921 | 1920 | 1919 | 1918 | 1917 | 1916 | 1915 | 1914 | 1913 |
|---|---|---|---|---|---|---|---|---|---|
| Town .. | 1076 | 1083 | 1180 | 1359 | 1255 | 1168 | 1008 | 1317 | 1128 |
| Mkokotoni Dist. | 893 | 800 | 859 | 1109 | 947 | 881 | 1005 | 801 | 889 |
| Chwaka ,, .. | 512 | 439 | 402 | 451 | 444 | 394 | 378 | 299 | 328 |
| Mwera ,, .. | 780 | 719 | 718 | 955 | 844 | 814 | 829 | 721 | 766 |
| Total .. | 3261 | 3041 | 3159 | 3874 | 3490 | 3257 | 3220 | 3138 | 3111 |

## TABLE XXII.

### Monthly Distribution of Deaths registered in Zanzibar Island during 1921 compared with the average for the previous nine years.

(Deaths at Walezo Leper and Poor Asylums are not included in this return.)

| | Town. | Average for 9 years. | Mwera. | Average for 9 years. | Chwaka. | Average for 9 years. | Mkokotoni. | Average for 9 years. | Total. | Average for 9 years. |
|---|---|---|---|---|---|---|---|---|---|---|
| January .. | 99 | 80·4 | 79 | 58·4 | 42 | 29·4 | 53 | 65·9 | 273 | 234·2 |
| February .. | 67 | 73·8 | 36 | 48·2 | 34 | 22·3 | 73 | 59·6 | 210 | 203·9 |
| March .. | 78 | 85·1 | 60 | 53·3 | 36 | 24·9 | 75 | 59·9 | 249 | 223·2 |
| April .. | 78 | 84·3 | 56 | 58·6 | 42 | 29·1 | 65 | 67·8 | 241 | 239·8 |
| May .. | 70 | 95·7 | 59 | 64·6 | 42 | 31·8 | 74 | 78·4 | 245 | 270·4 |
| June .. | 59 | 102·2 | 87 | 60·0 | 55 | 32·2 | 84 | 80·1 | 284 | 274·4 |
| July .. | 76 | 98·3 | 67 | 68·9 | 65 | 34·2 | 103 | 97·2 | 311 | 288·7 |
| August .. | 90 | 97·0 | 94 | 75·7 | 44 | 34·4 | 90 | 86·9 | 318 | 294·0 |
| September .. | 102 | 90·1 | 54 | 79·1 | 42 | 32·2 | 86 | 70·6 | 284 | 272·0 |
| October .. | 114 | 103·1 | 62 | 88·1 | 46 | 37·2 | 70 | 67·4 | 292 | 326·6 |
| November .. | 79 | 109·8 | 67 | 91·1 | 29 | 56·3 | 66 | 93·8 | 241 | 351·0 |
| December .. | 82 | 99·6 | 59 | 76·7 | 35 | 62·8 | 54 | 86·8 | 230 | 325·9 |
| Total .. | 994 | 1120·0 | 780 | 822·8 | 512 | 427·0 | 893 | 934·3 | 3178 | 3304·1 |

## Table XXIII.

## Monthly Rainfall—Zanzibar Town, 1912 to 1921.

| | | 1912 | 1913 | 1914 | 1915 | 1916 | 1917 | 1918 | 1919 | 1920 | 1921 | Average for 10 years |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | ... | 4·36 | 0·39 | 2·84 | 1·74 | 1·63 | 2·20 | 2·33 | 2·02 | 0·00 | 1·39 | 2·27 |
| February | ... | 6·99 | 1·37 | 0·05 | 0·76 | 3·50 | 4·29 | 1·36 | 1·07 | 0·08 | 2·48 | 2·17 |
| March | ... | 7·39 | 9·99 | 8·56 | 6·03 | 2·29 | 4·46 | 4·37 | 7·27 | 1·19 | 4·77 | 6·12 |
| April | ... | 13·09 | 17·59 | 12·69 | 9·62 | 33·35 | 16·49 | 11·55 | 8·85 | 8·47 | 17·00 | 15·81 |
| May | ... | 3·45 | 11·18 | 3·84 | 10·30 | 4·35 | 10·63 | 9·66 | 2·81 | 15·09 | 4·58 | 8·55 |
| June | ... | 0·47 | 0·07 | 0·88 | 5·00 | 1·38 | 4·20 | 6·27 | 0·20 | 0·77 | 0·37 | 2·07 |
| July | ... | 0·03 | 0·31 | 0·22 | 3·94 | 0·38 | 1·23 | 4·86 | 3·00 | 0·13 | 1·62 | 1·88 |
| August | ... | 1·04 | 0·88 | 3·65 | 0·45 | 2·11 | 2·05 | 0·60 | 1·63 | 1·41 | 0·59 | 1·60 |
| September | ... | 6·59 | 2·58 | 1·04 | 1·17 | 2·81 | 2·01 | 0·76 | 1·46 | 1·63 | 0·32 | 2·03 |
| October | ... | 0·98 | 4·22 | 0·89 | 2·63 | 5·83 | 2·27 | 5·77 | 3·21 | 5·88 | 5·39 | 3·05 |
| November | ... | 5·70 | 3·20 | 4·32 | 9·38 | 2·94 | 6·79 | 2·18 | 11·81 | 1·76 | 9·41 | 6·00 |
| December | ... | 17·82 | 1·31 | 4·37 | 0·61 | 2·92 | 0·44 | 6·79 | 4·65 | 7·62 | 1·79 | 4·84 |
| Total | ... | 67·91 | 53·09 | 43·35 | 51·63 | 63·49 | 57·06 | 56·50 | 47·98 | 44·03 | 49·71 | 55·69 |

## TABLE XXIV.

### Meteorological Observations—Zanzibar Town and Banani, Pemba, 1921.

| | ZANZIBAR TOWN | | | | | | BANANI, PEMBA | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | TEMPERATURE | | | | | TEMPERATURE | | | |
| | Rainfall | Relative Humidity | Mean Maximum | Mean Minimum | Absolute Maximum | Absolute Minimum | Rainfall | Mean Maximum | Mean Minimum | Absolute Maximum | Absolute Minimum |
| January .. | 1·39 | 73 | 86·8 | 79·1 | 88·8 | 74·3 | 2·63 | 87·1 | 78·7 | 90·5 | 76·0 |
| February .. | 2·48 | 71 | 88·5 | 80·3 | 91·6 | 76·2 | 0·07 | 88·7 | 79·7 | 91·0 | 78·0 |
| March .. | 4·77 | 74 | 87·3 | 79·8 | 90·0 | 75·6 | 9·94 | 87·7 | 79·0 | 91·0 | 74·5 |
| April .. | 17·00 | 81 | 85·1 | 76·6 | 89·2 | 74·1 | 34·42 | 85·6 | 77·2 | 91·5 | 74·0 |
| May .. | 4·58 | 80 | 84·1 | 75·9 | 86·1 | 73·0 | 10·90 | 85·0 | 76·9 | 88·0 | 74·0 |
| June .. | 0·37 | 78 | 82·5 | 74·2 | 84·8 | 72·3 | 1·93 | 83·9 | 75·3 | 86·0 | 73·5 |
| July .. | 1·62 | 78 | 81·4 | 73·0 | 83·4 | 71·1 | 2·36 | 82·4 | 74·6 | 84·0 | 73·0 |
| August .. | 0·50 | 76 | 82·3 | 73·1 | 83·8 | 71·1 | 0·61 | 83·4 | 73·7 | 85·0 | 73 0 |
| September .. | 0·32 | 70 | 83·9 | 73·8 | 87·1 | 72·2 | 0·73 | 84·7 | 74·6 | 87·0 | 73·0 |
| October .. | 5·39 | 73 | 84·3 | 75·6 | 86·7 | 73·4 | 1·49 | 85·7 | 75·8 | 88·0 | 72·0 |
| November .. | 9·41 | 76 | 86·2 | 78·0 | 89·4 | 75·7 | 4·10 | 87·3 | 78·4 | 90·0 | 76·0 |
| December .. | 1·79 | 72 | 87·6 | 80·2 | 89·4 | 77·6 | 1·47 | 88·5 | 79·8 | 92·0 | 77·5 |

## PART XI.—CONTROL OF OPIUM.

The controlled issue of opium to registered habitues in Zanzibar shows a further decrease in their number from 184 in **1920** to **167**, and a decrease in average monthly consumption of opium from 5 lbs. 1 oz. to 4 lbs. 1 oz.

The following table shows the races and sexes of those in the register at the close of 1921 as compared to 1920.

### TABLE XXV.

| Races | Males | Females | 1921 Total | 1920 Total |
|---|---|---|---|---|
| INDIAN— | | | | |
| Ismaili Khoja ... | 8 | 26 | 34 | 36 |
| Suni-Mohammedan | 27 | 10 | 37 | 41 |
| Ithnasheri Khoja ... | 5 | 6 | 11 | 13 |
| Banyan ... | 6 | — | 6 | 6 |
| Pathan ... | 2 | — | 2 | 2 |
| Baluchi ... | 3 | — | 3 | 3 |
| Rajput ... | — | — | — | 3 |
| Bohora ... | 1 | — | 1 | 1 |
| Swahili ... | 44 | 4 | 48 | 53 |
| Arab ... | 18 | — | 18 | 19 |
| Persian ... | 2 | — | 2 | 2 |
| Shihiri ... | 2 | — | 2 | 2 |
| Gazija ... | 3 | — | 3 | 3 |
| Total ... | 121 | 46 | 167 | 184 |

## FINANCIAL.

The sanctioned budget of the Public Health Department for the year 1921 was Rs. 285,693 and the amount actually spent was Rs. 257,127. The vote for Suppression of Infectious Diseases was found inadequate owing to the outbreak of Small-pox and the extraordinary measures taken to deal with it. A further provision of Rs. 13,000 was allowed by Special Warrant.

### EXPENDITURE.

| Vote. | Estimate. | | Actual Expenditure. | |
|---|---|---|---|---|
| | Rs. | £. | Rs. | £. |
| Personal Emoluments ... | 209,813 | 20,981 | 199,295 | 19,929 |
| Other Charges ... | 75,880 | 7,588 | 57,832 | 5,783 |

B. SPEARMAN,
*Senior Medical Officer of Health.*

Zanzibar, 28th June, 1922.

# REPORT ON THE PUBLIC HEALTH DIVISION, PEMBA.

## FOR THE YEAR 1921.

Pending the carrying out of the sanitary works which have been approved, an endeavour was made to make the best of existing conditions with the facilities available.

1. The town area was systematically cleared of overgrowth, the clearing being carried well beyond the houses. Although attention was called to Section 17 of " The Public Health Decree," copies of which were prominently posted up, this work was for the most part carried out by Public Health Department employees, and only a part of the cost was recovered. Having shown the owners of land what was expected of them, the intention was to insist in future on the work being done by them, or at least paid for by them. Owing to the rapid growth of vegetation, clearing has to be repeated every few months. A town plan would greatly facilitate this, as well as other branches of work of the Public Health Department.

2. Abatement of mosquito breeding areas :—

(*i*) The most dangerous and prolific source of anopheline mosquitoes was found to be the small Tanga area below the bluff on which stands the Public Works Department bungalow. During the rains, and for some months afterwards, this area is a swamp. It is too low-lying to be drained by ditches and, as a temporary measure, a number of pits were dug which were emptied by pails after each day as was necessary. Some " stone drains " were also constructed in this area; the stone filling, by maintaining a channel, is efficient so long as there is a fair flow of water, but as the flow lessens after the rains are over it is found that the channels get silted up and that it is than necessary to remove the stones and keep the ditch drained by the use of a mosquito larvæ " dipper " or similar tool. In the later stages of drying it is necessary to brush them out. As a result of these measures this area practically ceased to produce mosquitoes. As a permanent scheme it is proposed to lay agricultural drainpipes in this area if the fall is found to be sufficient. Alternative schemes are to cut a central tidal canal leading to the creek or to raise the level by filling in.

(*ii*) The various gulleys passing between the town and the European bungalows (the chief of which are the market and mosque gulleys) have been regularly attended to and have, I believe, almost ceased to contribute to the number of mosquitoes. They require most attention after the effects of the rains have passed off, when the comparatively small flow of water comes from the market and mosque drains with a slight addition from seepage and some small springs. These gulleys have been kept clear of vegetation and the small streams in them trained largely by the use of a " dipper " with the occasional help of a small pick. The gulley between Kitchanjani and Prison Villas has been similarly treated. It is the work of one man to attend to the Tanga area and the various gulleys.

(*iii*) To deal effectively with the extended swampy area north of the Industrial Mission House and west of Chachani is beyond the powers of the Public Health Department unaided. It is, however, from its position, less of a menace to the town generally and especially to the European quarter. A barrier, which existed towards the lower end of the main drainage channel, has been cut through and the bed of its course towards the creek cleared of obstruction to a considerable extent. This should help to lower the general water level of the swamp during future *masikas*. Several large pits in this area, which continued to hold water for months after the rains, have been cleared of all vegetation and should now be more easily kept free of mosquito larvæ. The water lying stagnant in some large hollows has been removed by pails and the depression partly filled in. Some water pits have to be left for the use of the cattle who graze on this area. To deal adequately with the swamp would require the digging to carefully taken levels of a channel throughout its entire length, fenced off from the invasion of cattle, but with the construction in several places of pools (formed by sinking cement or metal hoops of adequate depth) for watering cattle and affording washing facilities to the natives. In the dry season these pools would act as reservoirs and help to keep the rest of the channel dry. Some side channels, and perhaps agricultural drainpipes, would also be required in the surrounding area.

(*iv*) Another considerable source of anopheline mosquitoes is the stream which passes the Water Works Pumping Station. A certain amount of clearing of its banks has been done, but this requires to be continued up-stream for half a mile or so.

(*v*) In the bottom of the valley to the east of the town a drainage channel was cut several years ago. For some months after the rains this channel requires periodical clearing and training to prevent stagnation of water. Here also one or two washing pools might be made. At its south end, towards the Pumping House, this channel discharges indirectly into a gulley leading to the stream which flows past the Water Works; this gulley also requires periodical attention to keep it clear of growth and free from standing water. In the valley to the east of Kichangani there is a small gulley leading south to the Creek, which requires to be kept under observation. These main sources of anopheline mosquitoes are described in some detail, because the work on them requires to be kept up.

3. The scheme of surface drainage worked out by the Public Works Department is, I believe, to be carried out in the near future, and should appreciably lessen the work of the Public Health Department. The satisfactory disposal of sullage water from the houses is still an unsolved problem. The present cesspits (sullage pits), either from deficient depth or deficient porosity of soil, in many cases get rapidly filled up and there is sometimes difficulty in getting the owners to empty them as often as is required. Where there is no cesspit the sullage water is discharged by a length of open channel on to a sloping surface of the soil, a means of disposal which, while not desirable, need not with care become a nuisance,

and certainly need not lead to the breeding of mosquitoes. The employment of a tank on wheels with pump for emptying cesspits, as suggested by the Principal Medical Officer, would probably be helpful, but some of the cesspits are in rather inaccessible situations. If the system of cesspits is to be continued more care will have to be taken in choosing their sites and in their construction. They will, however, sooner or later have to be replaced by a proper system of closed drainpipes. Most of the Indian and some of the native houses have "choos" on the premises; the only circumstances under which they appear to create a nuisance is when a pipe leading from an upper stórey is in a leaky condition. Most of the natives betake themselves to the shores of the creeks or elsewhere in the open. There is no public latrine.

4. *Disposal of Town Refuse.*—The town refuse is still disposed of at four main dumps within the town area. Lately, more or less as an experiment, a small improvised incinerator has been established at three of these dumps; but at the best, even in the dry weather, they can burn only a small proportion of the rubbish. The vegetable and fruit refuse from the market form the most objectionable contribution to the dumps and the most difficult to dispose of. Owing to the deficiency in metal dustbins, a large number of disused cement barrels have been distributed throughout the area of the town to act as substitutes. They are kept in position by being placed over a stake fixed in the ground. An attempt has been made to induce shopkeepers and householders on the main streets to keep a small box as a dustbin for rubbish which has hitherto been thrown or swept on to the streets.

5. *Markets.*—No structural alterations have been made in the market. A considerable number of boxes for garbage have been distributed among the stallholders, and this has resulted in a considerable improvement in the cleanliness of the market. The present large open wooden garbage boxes are quite unsuitable; they are rendered less objectionable by a weekly washing with Jeye's Fluid. Daily, at closing time, a Public Health Department employee scrubs down the meat and fish stalls and helps generally in cleaning up the market. The Public Health Department also whitewashes the meat stall every few months. On Saturdays the vendors' boxes are removed to allow a thorough cleaning of their sites. The meat market requires a proper chopping-block, and its appearance would be much improved if the front of the stall were covered with white tiles laid in cement.

6. *Town Water Supply.*—No new work has been carried out in this connection. The quality of the water, judged by the absence of ill-effects from its use, seems to be satisfactory, but it is generally recognised that the supply cannot be regarded as sufficiently protected from pollution in certain eventualities. No alternative supply has yet been found.

7. The Soda Water Factory is run on satisfactory lines. The proprietor has asked to have water-taps introduced on his premises, but the Public Works Department has not seen its way to acquiesce.

8. Milk sellers are licensed, but are not under any special control. On the whole they keep their vessels satisfactorily clean, but an average specific gravity of 1,024 is evidence of some addition of water to the milk.

9. *Epidemic Diseases.*—In June two cases of Small-pox were discovered at Kisiwani. The cases and contacts were isolated locally. The first patient contracted the disease in Zanzibar. Both patients recovered. No other cases occurred. There were several outbreaks of Measles, Whooping-cough, and Chicken-pox. There were no cases recognised as Dysentery, or Cerebro-Spinal Meningitis.

10. *Death Returns.*—An attempt was made to check the registration of the causes of death by having the certificate in every case submitted to the Medical Officer by the person who brought it. In this way, however, the Medical Officer would probably become aware of the existence or prevalence of any disease requiring special attention from a public health point of view. It is probable that considerably more deaths occur from child-birth and the sequelæ of Measles and Whooping-cough than the returns show.

11. *Leper Settlements.*—In view of the unsatisfactory nature of the present settlements and of the early removal of all lepers to Funzi Island, no special endeavour was made to rope in all lepers at large and the custom was followed in a considerable number of instances of allowing lepers regarded as non-infectious to remain at home and report at stated intervals to the Medical Officer. The number of lepers in the settlements has somewhat decreased.

12. *New Works.*—The Isolation Hospital and the new Leper Shelter were completed during the year. The present quarters of the Public Health Department are inadequate and in disrepair. No official quarters have yet been provided for the Sanitary Inspector.

13. Inspection of water-containers in houses for mosquito larvæ has been regularly carried out and the results seem to show that the people appreciate the importance of attending to this matter. Cesspits and a number of water tanks have been oiled every week. Ankylostomiasis and Bilharziasis are very prevalent. Other duties have left the Medical Officer no leisure for trying to advance the study or control of these diseases. Little can be expected from treatment while prophylaxis is neglected.

14. *Staff.*—The staff, when working full strength and properly supervised, is certainly no more than adequate to the present work of the Public Health Department. There are, however, nearly always several absentees and owing to the custom of regarding their forfeited pay as "fines" to be paid into the Treasury,

so much labour is entirely lost to the Department, and this has on occasion amounted to as much as a quarter of the month's pay list. I would suggest that a certain sum be allotted monthly for the work of the Department, to be expended in the payment of permanent staff or casual labour as may suit the existing circumstances. The Sanitary Inspector, with his considerable clerical duties, vaccination tours and supervision of the Leper Settlement, has not sufficient time properly to supervise the work at Weti, Mkoani and other parts of the Island. The position of overseer is at present vacant and should be filled by a responsible and conscientious man.

### WETI.

Throughout the year Mr. Bhicoo was in charge of the work of the Public Health Department. The Medical Officer paid several visits of inspection to Weti and gave directions and advice as regards clearing overgrowth and training of the drainage ditches in the various swampy areas. Notices were posted by the District Commissioner forbidding the grazing of cattle on swampy areas and directing that where they were allowed to graze they should be tethered in such a manner as to be unable to enter any of the ditches. It might be well to have recognised drinking places for the cattle. The drainage channels in the swamps have, in my opinion, been made too wide with the result that, as the flow of water decreases, it is difficult to concentrate it in a small channel at the bottom of the ditch.

The market and several of the stand pipes in the main street are badly in need of repair. The quarters of the Public Health Department are quite inadequate.

### MKOANI.

What has been said above in regard to clearing overgrowth and attending to the drainage ditches in the swampy areas applies equally to Mkoani. In the last few months, through the enthusiasm and energy of the Assistant District Commissioner, the sanitary condition of Mkoani has been largely transformed. Extensive clearing has been done by the inhabitants themselves without expense to the Administration, and all rubbish is now burnt instead of being dumped as formerly.

Nothing has been done to improve the water supply or the market, and adequate street drainage is still lacking.

P. L. CRAIG,

*Medical Officer of Health, Pemba.*

Pemba, March 27th, 1922.

# REPORT ON THE VETERINARY SECTION

## FOR THE YEAR 1921.

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### Diseases of Cattle.

No outbreak of any contagious or infectious disease was reported during the year. The general health of stock has been satisfactory.

*East Coast Fever.*—Out of 165 animals examined, 25 were found infected, 13 being imported cattle. The mortality among calves is very heavy. Twenty-three calves were examined and nine found infected. These animals are kept within their dark and insanitary byres in the town and never allowed to leave them. The only possibility of their contracting the disease appears to be through the introduction of infected ticks with fodder brought from the shambas.

Four buffaloes were examined and three found infected. These animals were the property of the Government. From enquiries made it was found that they had been grazed for a considerable time in the Government plantations at Koani and Machui. All of them showed Kochs' Blue Bodies in spleen smears, which were typical and seen in large numbers.

The dipping tank at Pigaduri has been in use throughout the whole year. Imported cattle were dipped there at a three-day interval; 9,809 dippings being performed.

The new dipping tank at Mji Mpia was completed at the beginning of the year and opened on the 15th of May. Cattle were dipped there at a five-day interval. The number of animals dipped was 7,493.

Chemical analysis of the dipping fluid were made monthly at the Public Health Laboratory. Samples were also sent as controls to the Chemical Department, Nairobi, and corrections made from time to time according to the reports received.

*Trypanosomiasis.*—At the beginning of the year under review a new system was introduced of branding and preparing blood films of all imported cattle for Trypanosomiasis. The statistical records are given in Table VII. The total number of imported animals examined for this disease was 1,169. Out of these 74 cattle revealed parasites of the *pecorum* type in their blood on microscopical examination. The infection rate in animals imported from Tanganyika Territory was very heavy compared to Kismayu. It is noteworthy that, though the rate of infection in these beasts was very high, none of them manifested any clinical symptom of the disease.

All infected animals are immediately slaughtered at the Quarantine Park in order to reduce to a minimum the danger of infection and to check the introduction of any new strain into the Protectorate. Forty local oxen were examined and five found infected.

*Tuberculosis.*—Four cases of this disease were detected in the Bombay breed of cows from the town dairies. In all cases old tubercular lesions were confined to the kidneys and mesenteric glands.

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*Echinococcosis.*—Many of the cows from the town dairies, especially the Indian breed, show infection on *post-mortem* examination. The disease has also been seen in cattle imported from Tanganyika Territory.

*Hæmonchiasis* is very common in goats, sheep and cattle. Losses in our experimental sheep amounted to five deaths among lambs. Dipping appears to be doing some good.

*Contagious Pleuro-Pneumonia of Goats.*—As mentioned in previous reports, this is one of the commonest diseases, among goats imported from Kismayu. Every batch landed in the Quarantine Park show a number of cases during their first day, which under certain conditions may affect 50 to 70 per cent. of the herd. The disease is typified by thick nasal discharge, incessant sneezing, coughing, elevation of temperature and a typical tucked-up appearance of the animal. Very often the disease is accompanied with intestinal disturbance, such as purulent blood-stained diarrhœa. The disease has not been noted in indigenous goats, but experimental animals herded with infected Somali goats contract and die of the disease.

*Distomiasis.*—A few cases were seen in the abattoir among cattle imported from Tanganyika Territorry.

*Oesophagostomiasis.*—Many of the local goats, on *post-mortem* examination, are found infected.

## Diseases of Equines.

*Horse Sickness.*—One case of this disease occurred during the year. *Post-mortem* examination showed characteristic lesions of the disease.

*Glanders.*—No case reported or seen.

*Epizootic Lymphangitis.*—No case reported or seen.

*Trypanosomiasis.*—Out of 16 horses examined one showed parasites of *Trypanosomiasis Pecorum* type. This animal was the property of an Indian, who kept him for a long time on a shamba near Mwera, where the animal seems to have picked up the infection. This horse died after about six weeks' illness.

The blood of 43 donkeys was microscopically examined and one found infected.

## DISEASES OF CANINES.

*Rabies.*—No case reported.

*Trypanosomiasis.*—Seven dogs were examined and one found infected.

## VETERINARY HOSPITAL.

In all, 64 animals were admitted to the Veterinary Hospital, Kisiwandui, as follows :—

| | |
|---|---|
| Bullocks ... | 26 |
| Mules ... | 8 |
| Donkeys ... | 28 |
| Cows ... | 1 |
| Goats ... | 1 |
| Total ... | 64 |

Nearly all of them were cruelty cases, sent by the Police for such trivial complaints as galls, sores, wounds, abcesses, lameness, debility, etc.

## TABLE I.

### Death report for 1919—1921.

| | 1919 | 1920 | 1921 |
|---|---|---|---|
| Milch Cows (ex-Dairies) ... | 41 | 32 | 36 |
| Calves (ex-Dairies) ... | 22 | 16 | 24 |
| Cart Bullocks ... | 26 | 10 | 9 |
| Oxen ... | 31 | 39 | 8 |
| Horses ... | 7 | 2 | 4 |
| Donkeys ... | 17 | 9 | 6 |
| Mules ... | 3 | 2 | 1 |
| Goats ... | 438 | 247 | 197 |
| Sheep ... | 48 | 9 | 10 |
| Buffa'oes ... | 2 | 4 | 3 |
| Camels ... | 6 | 5 | 2 |
| Total ... | 641 | 375 | 300 |

It will be seen from the above table that, compared to the previous two years, deaths among stock were considerably less. As usual the great majority of Kismayu goats succumbed to Pleuro-Pneumonia Contagious. These animals come from Kismayu infected with the disease, and the lack of food and water on board the coast steamers does much to accelerate the mortality by lessening the vitality and strength of these beasts.

## TABLE II.

Imported animals quarantined at Pigaduri Cattle Quarantine Park :—

| | 1919 | 1920 | 1921 |
|---|---|---|---|
| Oxen | 1,186 | 1,637 | 1,298 |
| Cows | 165 | 92 | 156 |
| Calves | 123 | 43 | 42 |
| Goats | 7,413 | 8,910 | 9,406 |
| Sheep | 631 | 1,258 | 1,858 |
| Kids | ... | ... | 28 |
| Camels | 13 | 41 | 16 |
| Donkeys | 15 | 18 | 24 |
| Horses | 20 | 9 | 5 |
| Mules | 8 | 10 | 1 |
| Foals | ... | ... | 1 |
| Dogs | 5 | 5 | 3 |
| Cats | ... | 2 | ... |
| Total | 9,579 | 12,025 | 12,838 |

With the exception of a few horses and dogs which were accompanied by satisfactory health certificates, all animals imported in Zanzibar were quarantined at Pigaduri Quarantine Park at the discretion of the Veterinary Officer. Donkeys and horses having no Mallein certificates were subjected to the test.

All imported cattle are dipped at the Quarantine Park at a three-day interval, as a preventive measure against East-Coast Fever.

There was no outbreak of East-Coast Fever at Pigaduri.

## TABLE III.

Stock exported :—

| | 1919 | 1920 | 1921 |
|---|---|---|---|
| Oxen | 140 | 50 | 51 |
| Cows | ... | ... | 5 |
| Calves | 1 | 3 | 5 |
| Goats | 138 | 161 | 176 |
| Sheep | ... | 14 | 23 |
| Kids | ... | 20 | 6 |
| Camels | ... | 6 | 1 |
| Buffaloes | ... | 1 | 1 |
| Dogs | ... | 1 | 1 |
| Horses | ... | ... | 1 |
| Total | 279 | 256 | 270 |

The above table gives the number of animals exported compared to the previous two years. The majority of them went to Pemba and a few to the mainland. All animals are examined before shipment.

## TABLE IV.

Animals examined and slaughtered :—

| | Slaughtered in Government Abattoirs. | | | Carcases Condemned. | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Wholly. | | | Partially. | | |
| | 1919 | 1920 | 1921 | 1919 | 1920 | 1921 | 1919 | 1920 | 1921 |
| Oxen .. | 1069 | 1395 | 1413 | 32 | 36 | 19 | 952 | 1141 | 1027 |
| Cows .. | 57 | 41 | 63 | .. | .. | 1 | 51 | 40 | 76 |
| Calves .. | 6 | 16 | 32 | .. | .. | .. | 1 | 4 | 9 |
| Goats .. | 10789 | 14949 | 12781 | 6 | 10 | 20 | 3657 | 3286 | 2313 |
| Sheep .. | 745 | 1106 | 1452 | .. | 2 | 1 | 376 | 538 | 425 |
| Camels .. | 4 | 20 | 10 | .. | .. | .. | 2 | 18 | 4 |
| Buffaloes .. | 12 | 1 | 6 | .. | .. | .. | 12 | .. | 2 |
| Total .. | 12682 | 17528 | 15757 | 38 | 48 | 41 | 5051 | 5027 | 3856 |

All meat is examined before being passed to the public. Nineteen oxen and one cow were wholly condemned on account of Measles, 20 goats and one sheep for Pleuro-Pneumonia Contagious and emaciation. As usual, a large number of goats and sheep brought to the slaughter-house were rejected as unfit for slaughter and returned to their owners. It is to be regretted that the quality of meat is not as good as it should be. Animals lose much of their body-weight when being brought to this port on account of their getting very little food and water on board the coast steamers and dhows for several days. The above table shows a slight decrease in the number of animals slaughtered compared to the previous year.

## TABLE V.

Post-Mortems :—

| | No. Performed. | Hæmonchiasis. | Deaths from E. C. F. | Tuberculosis. | Trypanosomiasis. |
|---|---|---|---|---|---|
| Oxen ... | 12 | ... | 2 | ... | .. |
| Cows ... | 36 | ... | 9 | 4 | ... |
| Calves ... | 17 | 1 | 7 | ... | ... |
| Goats ... | 4 | 1 | ... | ... | 1 |
| Sheep ... | 7 | 5 | ... | ... | ... |
| Horses ... | 1 | ... | ... | ... | 1 |
| Donkeys ... | 1 | ... | ... | ... | ... |
| Buffaloes ... | 3 | ... | 2 | ... | ... |
| Total ... | 81 | 7 | 20 | 4 | 2 |

Nearly all animals which die in the town area are subjected to a *post-mortem* examination. The number of deaths from East-Coast Fever was 20. Tuberculosis was responsible for the deaths of four cows, which died in the town dairies. The remainder were either from such common complaints as Colic, Gastrits, Pneumonia, Metritis, Debility, etc., or were not diagnosed.

## Table VI.

East-Coast Fever, local stock :—

| | | No. examined. | Positive. | Negative. |
|---|---|---|---|---|
| Cart Bullocks | ... | 4 | 1 | 3 |
| Bombay Cows | ... | 7 | 2 | 5 |
| Other Town Cows | ... | 4 | 2 | 2 |
| ,, ,, Calves | ... | 12 | 4 | 8 |
| Buffaloes | ... | 3 | 2 | 1 |
| ,, calf | ... | 1 | 1 | ... |
| Total | ... | 31 | 12 | 19 |

East-Coast Fever, imported stock :—

| | | No. examined. | Positive. | Negative. |
|---|---|---|---|---|
| Dar-es-Salaam Cattle | ... | 100 | 2 | 98 |
| Socotran Cows | ... | 17 | 4 | 13 |
| ,, Calves | ... | 11 | 5 | 6 |
| Montgomery Cows | ... | 2 | 1 | 1 |
| Kismayu Cattle | ... | 2 | ... | 2 |
| Barawa Cow | ... | 1 | 1 | ... |
| Total | ... | 133 | 13 | 120 |

## Table VII.

Trypanosomiasis, local stock :—

| | | No. examined. | Positive. | Negative. |
|---|---|---|---|---|
| Oxen | ... | 40 | 5 | 35 |
| Calf | ... | 1 | ... | 1 |
| Horses | ... | 16 | 1 | 15 |
| Mules | ... | 3 | ... | 3 |
| Donkeys | ... | 43 | 1 | 42 |
| Dogs | ... | 7 | 1 | 6 |
| Total | ... | 110 | 8 | 102 |

Trypanosomiasis, imported stock :—

| | No. examined. | Positive. | Negative. |
|---|---|---|---|
| Kismayu Cattle ... | 579 | 20 | 559 |
| Warsheikh Cattle ... | 13 | ... | 13 |
| Barawa Cattle ... | 55 | 5 | 50 |
| Dar-es-Salaam Cattle ... | 304 | 47 | 257 |
| Merka Cattle ... | 52 | 1 | 51 |
| Adala Cattle ... | 8 | ... | ... |
| Socotran Cows ... | 112 | ... | 112 |
| Dar-es-Salaam Goats ... | 30 | ... | 30 |
| Somali Coast Camels ... | 8 | 1 | 7 |
| Horses ... | 4 | ... | 4 |
| Donkeys ... | 3 | ... | 3 |
| Mules ... | 1 | ... | 1 |
| Total ... | 1,169 | 74 | 1,087 |

SHAH MOHAMMED KHAN,
*Veterinary Officer.*

Zanzibar, 29th June, 1922.

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